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Three Sanskrit Inscriptions: Copies of the Originals, and Prefatory Observations.—*By* FITZ-EDWARD HALL, ESQUIRE, D. C. L.

The first among the memorials now edited has already appeared in the pages of this Journal;* but in a transcript so unfaithful, as to have concealed all its facts of highest value. Otherwise, it would not, certainly, have been left to the writer to discover the position of the ancient kingdom of Chedi; and, probably, the researches of some other investigator would have identified the insignificant village of Tewar with Tripurí, the Chedian capital.†

* For 1839, pp. 481—495. Specimens of the errors which bestrew the old decipherment—a most careless and unconscientious performance,—will be given in foot-notes. Nor is the English translation a translation properly so-called.

† Tripurí is mentioned twice; Chedi, once. The places will be indicated.

For Tripurí, in connexion with Rájá Vákpati, alias Munja, of Ujjayiní, see the note after the next.

At Bhelsá, within the fort, I recently found a fragmentary inscription, built into the outer wall of a modern house, and looking upon one of the streets of the town. Subjoined is all that remains of a record of which perhaps a full half is missing:

* * * * * * * श्रियमयमपि नन्वाश्रिता नाश्रिनाश्च
गेहं मे वेचवत्या नियमितजनतावोभमस्याऽप्यजस्रम्।
तेजोमय्यव चोचैर्विततमिति विदित्वाऽऽदरेणाऽऽत्मतुल्यं
भाद्भस्वामिनामा रविरवतु भुवः स्वामिनं क्षणराजम्॥
चेदीशं समरे विजित्य शबरं संहृत्य सिंहाक्षयं
राज्ञामण्डलरोदपाद्यवनिपो भूय्यां प्रतिष्ठाप्य च।
देवं द्रष्टुमिहाऽगतो रचितवांस्तोत्रं पवित्रं परं
श्रीमत्क्षण्टपैकमन्त्रिपदभाक् कौण्डिन्यवाचस्पतिः॥
सुचिरमियं क्षतिरास्तां रुचिरा श्रीमङ्गजाङ्कुशेयस्य।
काकूकेन विलिखिता कायस्थेन * * * *॥

The inscription begins with a doxology to Vishṇu; to the lotus of his navel; to Brahmá, who originated therefrom; to Brahmá's son, Atri; and to the Moon, which emanated from one of Atri's eyes.

From the Moon, by a daughter of the Sun, sprung Bodhana; and from him was born Purúravas, who had to wife Urvas'í and Earth. Among the descendants of Purúravas was Bharata. To him the Haihayas traced their origin; and from these came Kártavírya, the founder of the family of Kalachuri.* To this family belonged the last dynasty that dominated over Chedi.

For want of context, and from other causes, entire certainty as to the drift of this throughout is impossible. But that thus much is asserted, one may be pretty confident. Kauṇḍinya, entitled Váchaspati, was premier of a Rájá Krishṇa, and dwelt on the Vetravatí. After discomfiting the lord of Chedi, by slaying a S'abara named Sinha,—probably the Chedian generalissimo,—he established the district of Rálá, and Rodapádi, which, also, seems to denominate a district. Manifestly in honour of these successes, he repaired to the places where the inscription was set up, and had these lines written in praise of the sun, under the epithet of Bháilla; which divine luminary is invoked to serve as King Krishṇa's protector. Gajánkus'eya composed the eulogy, and Kákúka copied it.

Apparently, Krishṇa's newly annexed districts were wrested from Chedi. But whether that kingdom reached, previously, as far towards the west, as the banks of the Vetravatí, is undetermined. As for the antiquity of the memorial, it would be unsafe to base any conclusion on its palæography. I am convinced, from inspection of inscriptions nearly contemporary, that archaism of appearance was sometimes studiously affected in these records.

There is no ground to suppose, that the inscription was brought to Bhelsá from a distance. Once displaced from its original position, it must have had—such is the Indian indifference to relics of the past—no value except for the feet and inches of the tablet on which it is engraved; and the vicinity of Bhelsá does not want for stone-quarries. The sun, as Bháilla, was, we see, once an object of worship. At first sight, the word has, certainly, a barbarous aspect;* and yet it may possibly have been formed, anomalously, from *bhá*, "light" and the Vaidika root *il*, defined by the grammarians "to throw:" "the thrower of light." Euphony may have doubled the final consonant. To Bháilla add *ís'a*, and the combination is *Bháillesís'a*. Soften this, and we easily account for Bhelsá. Bháilla, as will be seen a few pages on, at one period gave name to a tract of country comprising twelve districts.

It may now be considered as certain, that Bhelsá was not so called because of its occupation by Bheels. See this Journal, for 1847, p. 745.

Independently of the references in this paper, Bháilla, the divinity, is mentioned in an inscription somewhere in Gwalior, of which I have formerly spoken. *Vide* p. 7, *Supra*, second foot-note.

* Or, optionally, it should seem, Kulachuri. In the sixth stanza of the following inscription is Kulachuri; but Kalachuri is implied in the thirteenth stanza. The latter form is read, unmistakably, on the Gopálpur tablet. See, further note *d*, at p. 517 of the *Journal of the American Oriental Society*, Vol. VI.

The tablet just adverted to is said to have been transported from Karanbel, a few miles distant from the spot where it now lies. I examined it on the fifth

[* Might it be the Prákrit termination *illa* for *matup?* Vararuchi (iv. 25) gives *máḍáilla* for *máḍárat.*—Eds.]

Beginning with Yuvarája, father of Kokalla, and ending with Ajayasinha, heir-apparent, the line of kings recorded in the inscrip-

of last January. Gopálpur is a small village on the Nerbudda, about ten miles from Jubulpore. Some twenty or thirty years ago, as I was informed, in an attempt made to remove the tablet, it was broken.

The space occupied by writing,—twenty lines and two-fifths,—measures about a yard and a half by two feet. The inscription is entirely in verse, and it has no date. Its left-hand portion, the smaller, contains few words any longer decipherable; and the right-hand portion is legible only here and there. Still, the fragments which I here annex leave no doubt as to its origin.

Line VI. चासीत् तस्य सहस्रपाणिकिरणैर्वंशः सहस्रार्जुनः ।
„ VII. * * * * * * ०कलचुरिकुलललामभूतः ।
„ IX. ०कर्णदेवः ।
„ XI. श्रीयशः कर्णदेवोऽस्य पृथ्वीपतिरभूत् सुतः ।
„ XV. रराज राजव्रजधर्मराजस्
तस्याऽनुजः श्रीजयसिंहदेवः ।
„ XVI. श्रीमद्गोसलदेवो ।
जयति तद् * * क्ष्माधरः श्रीविजयसिंहदेवनृपः ।
यद्सिः शत्रुषु कालः सूते शुभं यशश्चित्रम् ॥
श्रीसोमराजकृतं राजावलोवर्णनसिति ।
„ XVII. तस्माद्खर्वगुणपर्वतगर्वितोऽन्तः
श्रीमल्हणः ।
„ XVIII. जोगलेति प्रियाऽनूढा तस्याऽसीच् चारुदर्शना ।
हृद्यानन्दजननी सम्पतिरिव निश्चला ॥
„ XIX. * * * * * * गणः किल निजः सम्प्रेषितो यः क्षितिम् ।
तामुत्कर्षयितुं कृती हरिगणस्तस्मात् स जज्ञे ध्रुवम् ॥
„ XX. महादेवीति नाम्नाऽसोद् धर्मपत्नी पतिव्रता ।
सुचरिताऽपराऽप्यस्य * * * सहधर्मिणी ॥

Here we have the names of Arjuna the thousand-armed, of Kalachuri, Karna, Yas'ahkarna, Jayasinha, Gosala, and Vijayasinha; and these names indicate, that the inscription is Chedian, and of nearly the same time with that of the inscription printed at large in the coming pages. Whose concubine madam Jogalá was, does not appear. Nor is it known who Harigana and Malhana were. Equally in the dark are we as to the bigamous husband of Mahádevi and of another lady whose name has been obliterated. Finally, a part, at least, of this memorial was composed by one Somarája.

Malhana, I think, is a name that occurs in the Rájatarangini. But I write in the wilderness, with few books about me. For Malhana of Kanauj, see Dr. Aufrecht's account of the *Vis'wa-prakás'a* in *Cat. Cod. Manuscript. Sanscrit.* &c., p. 187.

Last Christmas I was encamped at Bilahari,—in the Jubulpore district,—which place the common fame of the neighbourhood connects with Rájá Karna. It must once have been a town of some importance. I found there one complete inscription, in the character of twelve or fifteen hundred years ago, but well nigh completely obliterated by time and weather; and two fragments of a second

tion is so well-known, that their names need not be repeated.* Of their family we are here furnished with a few facts additional to those which I have detailed on former occasions.† Gángeya died at Prayága, or Allahabad ;‡ and we are led to infer, that his wives, amounting, in round numbers, to a hundred, underwent cremation with the mortal remains of their lord.§ Karṇa built the city of Karṇávatí.‖ The consort of Gayákarṇa, or Gayakarṇa, was Alhaṇa ;

inscription, less ancient, and yet, what from discontinuity and effacement, no longer intelligible. It mentions a Rájá Indra.

* An inedited inscription, much mutilated, which I have very lately examined at Udayapura, in Gwalior, sets forth, that Vákpati,—whom I know to have been the same with Munja,—defeated Yuvarájá, and took possession of Tripurá. Vákpati lived in the tenth century ; and a synchronism of some value is thus established. I must, however, choose a time of leisure to enlarge upon its consequences.

But the inscription adverted to settles one point to which I cannot here forego reference. The father of Bhoja of Dhárá was Sindhu, not Sinha ; and he is called younger brother of Vákpati, not elder brother. Vákpati had issue in Vairisinha ; and Vairisinha had a son, Harsha. It seems probable, that the accession of Bhoja to the throne was owing to their having pre-deceased him.

At p. 205 of last year's Journal, building on what now turn out to be imperfect and erroneous data regarding the rulers of Málava, where I have spoken of Vákpati as being cousin-german to Bhoja, I ought to have written "first cousin once removed." But my new inscription shows, as has been seen, that he was Bhoja's paternal uncle. Nor was Vákpati's kingdom distinct from that afterwards subject to his nephew. Nor, again, is it now to be surmised, by way of consequence, that Bhoja's sway extended over less than the whole of Málava.

I return to the king Krishṇa spoken of two notes back. And who was he? Bhoja's grandfather's grandfather, Krishṇa, or Upendra, long preceded the presumed founder of the last Chedian dynasty, Yuvarája, who is reported to have been routed by Bhoja's uncle, Vákpati. It seems more likely, that we have here to do with the master of a kingdom intermediate to Chedi and Málava, and which was eventually absorbed by the latter.

Kokalla, of Chedi, son of the Yuvarájá just mentioned, is said to have defeated a Rájá Krishṇa in the south. A short time ago I expressed the opinion, that this Krishṇa "was, not impossibly," that ancestor of Bhoja with whom, as my fresh facts admonish, it is impossible to identify him. Future investigation may establish, that he was one with the Krishṇa of the Bhelsá inscription.

Of Kokalla I further wrote : "Again, the Bhoja whom he is recorded to have vanquished in the west, was, without much question, one of the two kings of Kanauj who bore that appellation." As Vákpati was of the same age with Yuvarája, we may conclude, that it was Bhoja of Málava, Vákpati's nephew, against whom Kokalla, son of Yuvarája, claims to have been successful. See last year's Journal, p.

† See the *Journal of the American Oriental Society*, Vol. VI., pp. 499—537 ; and this Journal for 1861, p. 318.

‡ Col. Wilford,—*Asiatic Researches*, Vol. IX., p. 108,—claiming the authority of a copper-plate grant for what he states, alleges, that Gángeya had the title of Vijayakaṇṭaka, and that "he died in a loathsome dungeon." This seems doubtful. Facts of such a nature would scarcely be spoken of, by an Indian panegyrist, of any one related to the magnate he is engaged in belauding.

§ See the eleventh stanza of the following inscription.

‖ In a literal translation, the twelfth stanza is as follows : "By whom, *Karṇa*, was established, on earth, a realm of Brahma, known as Karṇávatí ; the foremost

and that of Vijayasinha was Gosala. The appellations of these two ladies have hitherto been misrepresented.*

A crown-village, Choraláyí, in the *pattalá* of Sambalá, is transferred by the relique under notice, a legal document. The donor is Gosala, on the part of her son, Ajayasinha, a minor. The donee is a learned Bráhman, one Síḍha, son of Chhiktú, son of Súlhaṇa, son of Janárdana.† Six royal functionaries are enumerated in the grant; and the official designations are added of three more whose names are not specified.‡

abode of happiness, a root to the creeper of Vaidika science, a frontlet to the celestial river, a stay of Bráhmans."

The epithet of "celestial river" is usually appropriated to the Ganges. It is given, above, to the Narmadá.

I once suggested, that Karṇávatí might have been misread for Karṇávalí, and that the latter word might have been corrupted into Karanbel, the vernacular name of some ruins, marking the site of a once extensive city, adjoining Tewar, or Tripurí. Those ruins I have carefully explored. There is nothing to be said of them, further than that they now serve as an inexhaustible stone-quarry, and supply countless torsos of the most obscene sculpture that depravity could easily conceive.

As for the word Karanbel, its first two syllables may well be a corruption of Karṇa. The ending *bel* is not unknown to India, in designations of places: witness Bábúbel and Chaubebel, in the district of Ghazeepore. Sir H. M. Elliot thinks, that "it may possibly be connected with the Mongol *balu*, 'a city,' as in Khán-balu, the city of the Khán." *Appendix to the Arabs in Sind*, p. 214, foot-note.

Karṇávalí would have softened into Karnautí, or, more likely, into Karnaulí; Karṇávatí into Karnautí.

* In the forms Arhaṇa and Gásala.

† It is set forth, that he was of the *gotra* of Sávarṇi, and that to this *gotra* appertain the Bhárgana, Chyávana, Ápnaváṇa, Aurva, and Jámadagnya *pravaras*. There is a singular mistake here; for the *pravaras* of the Sávarṇyas are the Bhárgava, Vaitahavya, and Sávetasa.

A *gotra* is a family sprung from one of a certain number of Rishis, and from him denominated. *Pravaras* appear to be names of the families of certain persons from whom the founders of *gotras* were descended, and of the families of the founders themselves.

We read in the *A's'waláyana-kalpa-sútra*: यजमानस्याऽऽर्षेयान् प्रवृणीते यावन्तः स्युः परं परं प्रथमम्। Náráyaṇa Gárgya, *As'waláyana*'s commentator, says: आर्षेयः प्रवर इति पर्यायो आभ्यां ऋषिवंशनामधेयभूता आर्ष्टिषेणादयः शब्दा उच्यन्ते। Baudháyana asserts, in his *Kalpa-sútra*: विश्वामित्रो जमदग्निर्भरद्वाजोऽथ गौतमः अत्रिर्वसिष्ठः कश्यप इत्येते सप्तर्षयोऽगस्त्याष्टमानां यदपत्यं तद् गोत्रमित्युच्यते।

The explanation of *pravara*, on which Professor Max Müller's view of the expression is based, seems too artificial to demand acceptance, unless it turns out to be strongly corroborated by other Bráhmanical authority. See *A History of Ancient Sanskrit Literature*, &c., first edition, p. 386.

‡ Sáivácháryа Bhaṭṭáraka was *mahá-mantrin*, *Vidyá-deva*, *rája-guru*; Yajnadhara, *mahá-purohita*; Kíkí Ṭhakkura, *dharma-pradhána*; Vatsarája,—a pluralist, happy, or unhappy,—*mahákshapaṭalika*, *mahá-pradhána*, *artha-lekhin*, and *das'a-múlika*; and Purushottama, *mahá-sándhi-vigrahika*.

The present inscription is, by one year, the latest, as yet brought to light, published by the Haihaya rulers in Central India. We learn, from it, that the capital of those potentates, from the very first, was Tripurí; and that their kingdom, so long as they are known to have possessed it, was called Chedi. We find it set forth, that, "In that *Kalachuri* family was a monarch, eminent among the just, His Majesty Yuvarája,—a young lion in destroying odour-bearing elephants, *i. e.*, pride-blind kings,—who sanctified Tripurí, resembling the city of Purandara."*

As I have elsewhere made out, the era to which the date of the inscription is to be referred is a point still awaiting solution.†

INSCRIPTION I.

ॐ नमो ब्रह्मणे।

जयति जलजनाभस्तस्य नाभीसरोजं
जयति जयति तस्माज् जातवानब्जसूतिः ॥
अथ जयति स तस्याऽपत्यमत्रिस्तदक्ष्णास्
तदनु जयति जन्मप्राप्तवानब्धिबन्धुः ॥ १ ॥
अथ बोधनमादिराजपुत्रं ग्रहजामातरमब्जबान्धवस्य।
तनयं जनयाम्बभूव राजा गगनाभोगतडागराजहंसः ॥ २ ॥
पुत्रं पुरुरवसमौरसमाप सूनुर्
देवस्य सप्तजलराशिरसायनस्य।
आसीदनन्यसमभाग्यश्रुतोपभोग्या
यस्योर्वशीव सुकलत्रमिहोर्वरा च ॥ ३ ॥
अत्राऽन्वये किल श्रुताधिकसन्निमेध-
यूपोपरुद्धयमुनोक्षविविक्तकीर्तिः।
सप्ताब्धिरत्नरसनाभरणाभिराम-
विश्वम्भरासुभरतो भरतो बभूव ॥ ४ ॥
हेलाग्रहीतपुनरुक्तसमस्तश्लो
गोचे जयत्यधिकमस्य स कार्तवीर्यः।

Then come, unnamed, the *mahá pratihára*, the *dushṭa-sádhya-charádhyaksha*, the *bhándágárika*, the *pravátwa-vára*, and the *as'wa-sádhanaka*.

Of the duties of several of these officers nothing is known with certainty. The title before the last, with, perhaps, the last itself, is, probably, represented amiss. The *das'a-múlika* is called, near the end of the inscription *das'a-múlin*.

* So runs the seventh couplet. See the note on it, and two notes further on.

† See the *Journal of the American Oriental Society*, Vol. VI., p. 501.

अचैव हैहयन्द्रपान्वयपूर्वपुंसि
राजेतिनाम गुणलक्ष्मणि चक्रमे यः* ॥ ५ ॥
स हिमाचल इव कुलचुरिवंशमसूत क्षमाभृतां भर्ता ।
मुक्तामणिभिरिवाऽमलवृत्तैः पूतं सद्दोषतिभिः ॥ ६ ॥
तत्राऽन्वये नयवतां प्रवरो नरेन्द्रः
पौरन्दरीमिव पुरीं त्रिपुरीं †पुनानः ।
आसीन् मदान्धवपगन्धगजाधिराज-
निर्माथकेसरियुवा युवराजदेवः ॥ ७ ॥
सिंहासने नृपतिसिंहममुष्य सूनुम्
आरूढपन्नवनिभर्तुरमात्यमुख्याः ।
कोकल्लमर्णवचतुष्टयवीचिसङ्घ-
सङ्घट्टघट्टचतुरङ्गचभूप्रवारम् ॥ ८ ॥
इन्दुप्रभां निन्दति हारयुच्छं जुगुप्सते चन्दनमाक्षिपन्ती ।
यत्र प्रभौ दूरतरं प्रयाते वियोगिनीव प्रतिभाति कीर्तिः॥९॥
मरकतमणिपट्टप्रौढवक्षाः क्षितीशो
नगरपरिघदैर्घ्यं लङ्घयन् दोर्द्वयेन ।
शिरसि कुलिशपातो वैरिणां ‡वीरलक्ष्मी-
पतिरभवदयत्यं यस्य गाङ्गेयदेवः ॥ १० ॥
प्राप्ते प्रयागवटमूलनिवेशबन्धौ
सार्धं व्रतेन गृहिणीभिरमुत्र मुक्तिम् ।
पुत्रोऽस्य खड्गदलितारिकरीन्द्रकुम्भ-
मुक्ताफलैः स§ ककुभोऽर्चति कर्णदेवः ॥ ११ ॥
अग्र्यं धाम श्रेयसो वेदविद्या-
वल्लीकन्दः खःसवक्षाः किरीटम् ।
ब्रह्मस्तम्बो येन कर्णावतीति
प्रत्यष्ठायि ख्यातलब्रह्मलोकः ॥ १२ ॥
अजनि कलचुरीणां स्वामिना तेन कृष्णा-‖
न्वयजलनिधिलक्ष्म्यां श्रीमदावल्लदेव्याम् ।

* In the old decipherment, चाऽ करोत् सः.

† Formerly misread स्वपुरीं, "his own city." In the next line, there was also an error: गर्व, for गन्ध.

‡ Not, according to the old reading, वैरिणो.

§ In place of the स्व of my predecessor.

‖ It has not been proved, that the Hindus of old times applied the term

शशभृद्दयशङ्काच्चुब्धदुग्धाब्धिवीची-
सहचरितयशःश्रीः श्रीयशःकर्णदेवः ॥ १३ ॥
अत्युत्तुङ्गगिरीन्द्रकन्दरसरस्तीरं कथञ्चिद् गतैर्
ईषन्निर्वृतिमङ्गिरागतमिति त्रस्तैर्वदद्भिर्मिथः ।
आकर्ण्य प्रतिशब्दमम्बुनि निजं बिम्बं मिलद्वैरिवत्
संवीक्ष्य क्षणमासितं किमपरं यस्याऽरिभिस्तत् तथा॥१४॥
तस्याऽऽत्मजोऽभूदतुलप्रतापः
श्रीमद्दयाकर्ण इति प्रतीतः ।
यस्याऽऽहवेषूद्धतवैरिकण्ठच्-
छेदास्रपूरैरव धराऽनुरक्ता ॥ १५ ॥
ततांसुना दिक्षु यशोवितानम्
उन्नम्रवंशेन गुणान्वितेन ।
येनाऽरिकान्ताहृदयेषु गाढम्
आरोपितः सङ्गनि शोकशङ्कुः ॥ १६ ॥
असावलक्ष्मणदेव्यां श्रीनरसिंहनरेश्वरम् ।
सदनमिवेच्छायां प्रथमं सुषुवे सुतम् ॥ १७ ॥
उच्चैर्हिरण्यकशिपुप्रतिपादनेन
प्रीतिं परां विबुधसंहतिषु प्रकुर्वत् ।
सौन्दर्यभारविनिवारितमारगर्वश्
चित्रं तथाऽप्ययमहो नरसिंहदेवः ॥ १८ ॥
यो ब्रह्मणां पाणिषु पञ्चपाणि
दानानि धत्ते पयसः पृषन्ति ।
तैरेव दृष्ट्वामवधूय ते च
रत्नाकरेऽपि प्रथयन्त्यवज्ञाम् ॥ १९ ॥
महीभर्ता महादानैस्तैस्तुलापुरुषादिभिः ।

Húṇa to any but a division of the tribe of Kshatriyas. Venkaṭa Adhwarin, in a curious and fanciful work, doubtless indicates thereby the early Portuguese, settled in the vicinity of Madras. He has the fairness to commend the Húnas for their justice, and ingenuity in handicrafts. This acknowledgement is, however, set off against the accusation of cruelty, impurity, and cheap esteem for Bráhmans. "Greater reprobates would be harder to find in the world;" and "Their faults baffle description," दुर्लभाः खलु हूणेभ्यः क्रूरतितमा लोके; and तेषां दोषाः परे वाचाम् *Vis'wagunádars'a*, Bombay edition of *S'aka* 1774, *fol.* 22, *verso*.

In the present day, the pandits universally take Huṇa to denote Europeans.

गि* * * * * करत्यर्घं* कृतार्थयति योऽर्थिनः ॥ २० ॥
कुर्वन् महीं ब्राह्मणसादरिक्तनिबर्हणः ।
सार्धं परशुरामेण यः सार्धमधिरोहति ॥ २१ ॥
तस्याऽनुजो नरपतिर्जयसिंहदेवः
स्थैर्याज्वलैरपि नृपैः क्रियमाणसेवः ।
यद्दानलुब्धयशसेव सुरद्रुमेण
व्याप्ता भुवि भूतलतले बलिना प्रलीनम् ॥ २२ ॥
तष्टं† गुर्जरभूभुजा तु कुबलं मुक्तं तुरुष्केण च
त्यक्तः कुन्तलनायकेन सहसा कन्दर्पकेलिक्रमः ।
श्रुत्वा श्रीजयसिंहदेवनृपते राज्याभिषेकं नृपाः
सन्त्रासादपरेऽप्यपास्य जगतीं पारे ययुर्वारिधेः ॥ २३ ॥
कथञ्चिद् यद्यशश्चन्द्रचन्द्रिकाधवलीकृते ।
वलद्धा लक्ष्यते‡ व्योम्नि पततो खगसंहतिः ॥ २४ ॥
रमणगुणनिकेतः केतनं सङ्गलानां
प्रचुरतरयशोभिः शोभितक्षत्तनूजः ।
नृपतिरवनिभानुर्विश्वविश्रान्तभानुर्
जयति विजयसिंहः संहृतारातिसिंहः ॥ २५ ॥
दृष्टिर्यस्याः सुधावृष्टिः सन्निधिश्चाऽपि सन्निधिः ।
वाणी चिन्तामणिः श्रीमज् जीयाद् गोसलदेव्यसौ ॥ २६ ।

स च परमभट्टारकमहाराजाधिराजपरमेश्वरश्रीवामदेवपादानुध्यातपरमभट्टारकमहाराजाधिराजपरमेश्वरपरममाहेश्वरचिक्खिल्लाधिपतिनिजभुजोपार्जितास्वपतिगजपतिनरपतिराजत्रयाधिपतिश्रीमद्विजयसिंहदेवपतेर्विजयिनः महाराज्ञीश्रीमहाकुमारश्रीअजयसिंहदेवमहामन्त्रिशैवाचार्यभट्टारकश्रीमन्नाजगुरुविद्यादेवमहापुरोहितपण्डितश्रीयज्ञधरधर्मप्रधानमहामात्यठक्कुरश्रीकीकीमहाक्षपटलिकमहाप्रधानार्थलेखिठक्कुरश्रीदशूमूलिकवत्सराजमहासान्धिविग्रहिकठक्कुरश्रीपुरुषोत्तममहाप्रतीहारदुष्टसाध्यचराध्यक्षभाण्डागा-

* The मतिमाने-, formerly given as the first four syllables of this group, begins with alteration, and continues and ends with invention.

† Not राष्ट्रं, as formerly read. Nor, as was stated, is the गु of गुर्जर "obscure in the original."

‡ In place of लक्ष्यते, the old reading. Of the word following the first syllable is all but erased.

रिकप्रभात्ववारश्वसाधानक* इत्येतानन्यांश्च प्रदास्यमानग्रामनिवासिजनपदांश्चाऽऽहूय यथार्हं मानयति बोधयति समाज्ञापयति च।

यथा विदितमस्तु भवतां संवत् ६३२ श्रीमन्त्रिपुर्यां† युगादौ नर्मदायां विधिवत् स्नात्वा श्रीमन्महादेवं समभ्यर्च्य मातापित्रोरात्मनश्च पुण्ययशोभिवृद्धये सम्बलापत्तलायां चोरलायीग्राम चतुःसीमापर्यन्तचतुराघाटविशुद्धः सगोप्रचारः सजलस्थलः साम्रमधूकः सलवणाकरः सगर्त्तोषरः सनिर्गमप्रवेशः सजाङ्गलानूपो दक्षारामोद्भिदाद्यानष्टणादिसहितः‡ * * * * * * प्रवणिचरो रसवतीक्षामतवाडदण्डमार्गणकविष्टेणिमादायपट्टकिलादायदुष्टसाध्यादाय अर्धपुरुषारिकादायादिसमन्वितः सवनपर्वतः सघट्टादायसर्वबाधाविवर्जितः ग्रामोऽयं सावर्ण्यगोत्राय §भार्गवच्यावनाप्नवानौर्वजामदग्न्येतिपञ्चप्रवराय छन्दोगशाखिने पण्डितश्रीजनार्दनप्रपौत्राय पण्डितश्रीलक्ष्मणपौत्राय पण्डितश्रीक्षिक्षूपुत्राय पण्डितश्रीसीढशर्म्मणे ब्रह्मशासनोदकपूर्वकत्वेन शासनीकृत्याऽस्मदभ्यनुज्ञया माढश्रीमद्दोसलदेव्या प्रदत्तः ॥

अत्र चाऽभ्यर्थना दातुर्भवति यथा।

सर्वानेतान् भाविनः पार्थिवेन्द्रान्
भूयो भूयो याचते रामभद्रः।
सामान्योऽयं धर्मसेतुर्नृपाणां
काले काले पालनीयो भवद्भिः ॥ २७ ॥
बहुभिर्वसुधा भुक्ता राजभिः सगरादिभिः।
यस्य यस्य यदा भूमिस्तस्य तस्य तदा फलम् ॥ २८ ॥
सुवर्णमेकां गामेकां भूमेरप्येकमङ्गुलम्।
हरन् नरकमाप्नोति यावदाभूतसम्प्लवम् ॥ २९ ॥
तडागानां सहस्रेण अश्वमेधशतेन च।
गवां कोटिप्रदानेन भूमिहर्ता न शुध्यति ॥ ३० ॥

* Formerly altered to and printed ०प्रभत्तबारणाश्वखाधीनका.

† So, as I conjectured when I had not yet set eyes on the copper-plate of this grant, we should read, instead of the printed श्रीमन्त्रिपुर्यां. Here is the second mention of Tripurí in this memorial.

‡ The next six syllables are quite effaced. From this point to ऋर्ध० there is a blank in the old decipherment. My own reading yields little meaning; but the words are, evidently, unfamiliar technicalities. The receipts styled *dushṭa-sádhyálaya* must have had to do with the *dushṭa-sádhya-charádhyaksha*, who has already been spoken of.

§ च्यवन I have changed to च्यावन.

स्वदत्तां परदत्तां वा यो हरेत वसुन्धराम्।
स विष्ठायां कृमिर्भूत्वा पितृभिः सह मज्जति ॥ ३१ ॥
षष्टिवर्षसहस्राणि स्वर्गे वसति भूमिदः।
आच्छेत्ता चानुमन्ता च तान्येव नरके वसेत् ॥ ३३ ॥
यावत् सूर्यश्चतालोकस्तावत् स्वर्गे महीयते ॥ ३२ ॥
वारिहीनेष्वरण्येषु शुष्ककोटरवासिनः।
कृष्णसर्पास्तु जायन्ते देवब्रह्मस्वहारिणः* ॥ ३४ ॥
अन्यायेन हृता भूमिरन्यायेन तु हारिता।
हरतो हार्यतश्च दहत्यासप्तमं कुलम् ॥ ३५ ॥
अस्मत्कुलक्रममताः समुदाहरन्ति
अन्यैश्च दानमिदमभ्युपमोदनीयम्।
लक्ष्मीश्चला सलिलबुद्बुदवन् नराणां
दानं फलं परमतः परिपालनीयम्† ॥ ३६ ॥
प्रजाहितार्थं स्थितयः प्रणीता
धर्मेषु विद्वान् परिपालयेत।
यो लोभमोहाद्धरते दुरात्मा
सोऽधो व्रजेद् दुर्गतिमास्तु कष्टाम् ॥ ‡३७ ॥
यानीह दत्तानि पुरा नरेन्द्रैर्
दानानि धर्मार्थयशस्कराणि।
निर्माल्यवान्तप्रतिमानि तानि
को नाम साधुः पुनरादद्दीत ॥ ३८ ॥

* "Black serpents, abiding in arid hollows of trees, in unwatered wildernesses, do they become who usurp the property of the gods, or of Bráhmans."

It need scarcely be remarked, that Hindu land-grants are almost always followed by a number of stanzas pointed at the iniquity of wrongful resumption and such other high-handed proceedings.

At different times, and chiefly in this Journal, I have translated most of the verses appended to our inscription. I therefore confine myself, mostly, to rendering such of them as I have not before had occasion to put, at least from the readings here exhibited, into English.

† "They who have come down in our family declare, that this gift ought to be approved by others. Uncertain as a bubble of water is the fortune of men. Donation alone is *its* fruit. Hence *this donation* should be maintained."

The prosody of these verses is somewhat free.

‡ "The wise should keep up the laws connected with virtue, established for the good of the people. The reprobate who, from avarice, or delusion, shall usurp, will promptly incur a painful hell down below."

परिपालयेत is very dubious grammar.

भूमिं यः प्रतिगृह्णाति यश्च भूमिं प्रयच्छति ।
उभौ तौ पुण्यकर्माणौ नियतं स्वर्गगामिनौ ॥ ३९ ॥
शङ्खो भद्रासनं छत्रं वराश्वा वरवारणाः ।
भूमिदानस्य चिह्नानि फलमेतत् पुरन्दर ॥ ४० ॥
अस्मिन् वंशेऽन्यवंशे च यः कश्चिन् नृपतिर्भवेत् ।
तस्याऽहं हस्तलग्नोऽस्मि शासनं न व्यतिक्रमेत्* ॥ ४१ ॥
वाताभ्रविभ्रममिदं वसुधाधिपत्यम्
आपातमात्रमधुरो विषयोपभोगः ।
प्राणास्तृणाग्रजलबिन्दुसमा नराणां
धर्मः सखा परमहो परलोकयाने ॥ ४२ ॥
मद्वंशजाः परमहीपतिवंशजा वा
पापादपेतमनसो भुवि भाविभूपाः ।
ये पालयन्त्यमरविप्रभुवः स्वराज्ये
तेषां मया विरचितोऽञ्जलिरेष मूर्ध्नि† ॥ ४३ ॥

अभयधरस्य पौत्रेण श्रीधर्मस्य सूनुना लिखितं वत्सराजेन चेदीशदश-मूलिना । ‡ पण्डितश्रीकेशवलिखितम् ॥

* "Whatever king may be born in this *my* race, or in another race, I clasp his hands; *praying* that he will not violate *this* patent."

† "To those future kings, on earth,—whether born of my stock, or born of the stocks of other rulers,—who, with minds free from sin, protect, in their realms the lands of the gods and of Brâhmans, I clasp my hands above my head."

In the second quarter of this couplet, the plate has पापादनतमनसो. The old decipherment, hazarding a correction, gives: पापाणदण्डमनसो.

The metres of the foregoing stanzas are as follows:

No. of stanza.	*Name of metre.*
1, 10, 13, 25.	*Málini.*
2.	*Aupachhandasika.*
3, 4, 5, 7, 8, 11, 18, 22, 36, 42, 43.	*Vasantatiluká.*
6.	*A'ryá.*
9.	*Smriti.*
12, 27.	*S'álini.*
14, 23.	*S'árdúlavikríḍita.*
15, 19, 38.	*Indravajrá.*
16, 37.	*S'ubhá.*
17, 20, 21, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 39, 40, 41.	*Vaktra.*

‡ That is to say, the instrument was issued by the lord of Chedi's *daś'a múlin*, Vatsarája, son of Dharma, and grandson of Abhyadhara. In the original is चेदिश, which I have not scrupled to alter. No doubt the original was metrical, when it was placed in the hands of the engraver. A change of the third syllable of it to a double consonant, and the insertion of च before सूनुना,

सूत्रधारनामलेनोत्कीर्णम् ।*

शुभं भवतु ।

The next inscription, hitherto unpublished, is, like the first, engraved on copper. It has been transcribed from the original plates, which belong to the Asiatic Society of Bengal. The stanzas, nine in number, introducing the grant proper, have already appeared in print, and need not be repeated.† Nor are the verses that follow the prose of sufficient interest, on the score of novelty, to deserve copying.‡

INSCRIPTION II.

* * * * * * * * * * * * * * *

सोऽयं समस्तराजचक्रसंसेवितचरणः परमभट्टारकमहाराजाधिराजपरमेश्वरपरममाहेश्वरनिजभुजोपार्जितश्रीकन्यकुब्जाधिपत्यश्रीचन्द्रदेवपादानुध्यातपरमभट्टारकमहाराजाधिराजपरमेश्वरपरममाहेश्वरश्रीमदनपालदेवपादानुध्यातपरमभट्टारकमहाराजाधिराजपरमेश्वरपरममाहेश्वराश्वपतिगजपतिनरपतिराजत्रयाधिपतिविविधविद्याविचारवाचस्पतिश्रीमद्गोविन्दचन्द्रदेवो विजयी अन्तरालपत्तलायां करण्डग्रामकरण्डतल्ल अनयोर्महत्तमकैवर्तप्रभृतिप्रजालोकान् तथा निवासिनो निखिलजनपदानपि च राजराज्ञीयुवराजमन्त्रिपुरोहित-

would give a *Vaktra* stanza. The old decipherment has; अभुद्धरण्यत्र-श्रीधर्मसूनुना लिखितं वत्सराजेन वैदेशदशमूलिना.

* Not लेखितं as was formerly misread. But the plate wants the final consonant. And the name of the engraver is Lena, not Lema.

Confusion of sibilants has, in several instances, unspecified, been redressed in the transcript now printed.

On the seal attached to the two plates are the words श्रीमद्विजयसिंहदेवः. Above is a figure of Lakshmí, supported on each side by an elephant sprinkling her with water from its proboscis. Underneath is Nandí.

† See this Journal, for 1858, pp. 242, 243.

‡ Any one familiar with the poetical excrescences of Hindu land grants will recognize them by their opening words: भूमिं यः। शङ्खं। सर्वानेतान्। बहुभिर्वसुधा। गामेकां। तडागानां। वारिद्दीनेष्वरण्येषु। वाताभ्रविभ्रमिदं। स्वदत्तां। All but the last three of these stanzas will be seen at the page of this Journal following the last just referred to.

Thus ends the inscription, much more abruptly than is commonly the case with such writings.

On the seal, the ring of which holds together the two plates, are the words श्रीमद्गोविन्दचन्द्रदेव.

Above them is an effigy of Garuda, with folded hands: beneath is a conch-shell.

प्रतीहारसेनापतिभाण्डागारिकाच्छपटलिकभिषक्कनैमित्तिकान्तःपुरिकदूतकरितुरगपत्तनाकरस्थानगोकुलाधिकारिपुरुषानाज्ञापयति बोधयत्यादिशति च।

यथा विदितमस्तु भवतां यथोपरिलिखितग्रामतल्लौ सजलस्थलौ सलोहलवणाकरौ सगर्तोषरौ समधूकाम्रवनवाटिकाविटपट्टगयूतिगोचरपर्यन्तौ सोर्ध्वाधश्चतुराघाटविशुद्धौ खसीमापर्यन्तौ ज्ञात्वा विधिवन् मत्तदेवमुनिमनुजभूतपिट्टगणांस्तर्पयित्वा तिमिरपटलपाटनपटुमहसमुष्णरोचिषमुपस्थायौषधिपतिशकलशेखरं समभ्यर्च्य च भुवनत्रातुर्वासुदेवस्य पूजां विधाय मातापित्रोरात्मनश्च पुण्ययशोभिवृद्धये गोकर्णकुशलतापूतकरतलोदकपूर्वं राजश्रीयशःकर्णदेवेन राजगुरुणैवाचार्यभट्टारक श्रीरुद्रशिवपशोभिज्ञात्वेन शासनीकृत्य प्रदत्तौ तैश्च संवत् ११७७ कार्त्तिकशुक्लचतुर्दश्यां अस्मान् ससभ्यान् साक्षिणः कृत्वा ठक्कुरश्रीवसिष्ठगर्भ्य उदकपूर्वकं शासनीकृत्य प्रदत्तौ अस्मत्समक्षं ताम्रपत्रकं चाऽर्पितम् *अतपरिचेतदीयसन्तत्या च आचन्द्रार्कं यावत् भोक्तव्यौ मत्वा यथादीयमानभागभोगप्रवृत्तिकरप्रभृतिसर्वादायान् आज्ञाविधेयीभूय दास्यथेति।

* * * * * * * * * *

We are here told, that, in A. V. 1177, corresponding to A. D. 1120, a transfer of landed interest was made in presence of King Govinda Chandra, of Kanauj, and his court. The property that exchanged hands, the village of Karanḍa and the *talla*† of Karanḍa, in the *pattalá* of Antarála, passed from the possession of Bhaṭṭáraka Rudras'iva, a royal chaplain, into that of the Ṭhakkura Vasishṭha.

Rudras'iva, it is stated, was invested with his estate by Rájá Yas'ahkarṇa.‡ It can scarcely be questioned, that this was the ruler of Chedi. And how could the king of Kanauj have had authority, save as the result of conquest, over soil which was once under his control?

* Here is a blunder of the first magnitude. Other mistakes, not quite so glaring, have been left as they were found; while a few, of a trifling character, have been silently amended.

† This term is a stranger to all the dictionaries.

‡ Yas'ahkarṇa was son of Karṇa, whose grandfather Kokalla fought with Bhoja during the first half of the tenth century. In A. D. 1042, Bhoja was still on the throne. We know not how soon he may not have ascended it after A. D. 993, when Munja, or Vákpati, his predecessor, was as yet in power.

A Rudras'ambhu is named in one of the Chedian inscriptions.

See last year's Journal, p. 319; and Colebrooke's Miscellaneous Essays, Vol. II. pp. 462, 463.

Inscription III.

ओम् नमः शिवाय ।

संवत् १२२९ वर्षे वैशाखसुदि ३ सोमे। अद्येह आमदग्रहिलपदाङ्कसमस्तराजावलीविराजितमहाराजाधिराजपरमेश्वरपरममाहेश्वरश्रीअजयपालदेवकल्याणविजयराज्ये* तत्पादपद्मोपजीविमहामात्यश्रीसोमेश्वरे श्रीश्रीकरणादौ समस्तमुद्राव्यापारान् परिपन्थयतीत्येवं† काले प्रवर्तमाने निजप्रतापोपार्जितश्रीभाइल्लस्वामिमहादादशकमण्डलप्रभुज्यमाने‡ अद्येह श्रीउदयपुरे तेनैव प्रभुणा नियुक्तदण्डश्रीलूणपसाकेन धौतवाससी परिधाय परमधार्मिकेण भूत्वा अक्षयतृतीयायुगादिपर्वणि मुहिलउताव्ये राजपुत्रश्रीवीरहणदेवपुत्रपरमलोकान्तरितराजश्रीसोलणदेवश्रेयसे अवन्तदेवश्रीवैद्यनाथाय भट्टारिकाचतुःषष्टिपथके पञ्चोपचारपूजानिमित्तं सदक्षमालाकुलं दण्डजखाण्डयोपेतं§ चतुराघाटसमन्वितं उमरथाग्रामं‖ शासनेन प्रदत्तम्।

आघाटा यथा अस्य ग्रामस्य पूर्वतो नाहग्रामं दक्षिणतो वहिडाउगग्रामं पश्चिमतो देउलीग्रामं उत्तरतो लखणउडाग्रामम्एवं हि चतुःकङ्कटविशुद्धम्¶ ।

उक्तम् ।

बहुभिर्वसुधा भुक्ता राजभिः सगरादिभिः ।
यस्य यस्य यदा भूमिस्तस्य तदा फलम् ॥ १ ॥
स्वदत्तां परदत्तां वा यो हरेत वसुन्धराम् ।
षष्टिवर्षसहस्राणि अमेध्ये जायते कृमिः ॥ २ ॥
भान्धाता सुमहीपतिः कृतयुगेऽलङ्कारभूतो गतः
सेतुर्येन महोदधौ विरचितः क्वाऽसौ दशास्यान्तकृत् ।

* The original has अजयपल्ल. A little on is ०जोवी- also.

† Corrected from परिपन्थपतित्येवं. We have a strange word here. Others of the same kind are पथक and अनैष्ठिक. The last qualifies a name near the end of the inscription, and seems to denote an office.

‡ One line ending with an erasure, and the next beginning with डल, I have not hesitated to assume, that the missing symbol was मं.

§ The ख्ड in this compound is quite worn away; and it has been inserted on conjecture.

‖ Here, and on several occasions below, a masculine substantive is turned into a neuter.

As is usual in documents of this sort, the laws of *sandhi* are freely neglected.

¶ The word कङ्कट, "boundary," survives, in Málava, in the same sense, under the form of काँकड़.

अन्ये चाऽपि युधिष्ठिरप्रभृतयो यावद्भवा भूपतिर्
नैकेनाऽपि समं गता वसुमती मन्ये त्वया यास्यति* ॥ ३ ॥
इत्यादि परिभाव्य शासनमिदं पालनीयम्।
पत्तमनैष्किकमहाभट्टारकश्रीश्रीलकठरासिना उपार्जितमिदम्†।

This inscription I found in Udayáditya's magnificent temple to S'iva, at Udayapura in Gwalior. It is engraved in a bold hand, on a thick slab of stone, now detached from its original setting, and once contained at least twenty-two lines of writing, twenty and a half of which I print.

All that it has to communicate of value may be abstracted as follows. In the year 1229 of Vikramáditya, or A. D. 1172, the ruling sovereign was Ajayapála.‡ Somes'wara was his prime minister, general intendant of the royal signet, and governor of the twelve districts comprehended in Bháilla. At the time aforesaid,§ Lúṇapasáka, a military officer appointed by Somes'wara, bestowed upon Vaidyanátha, surnamed Avatya, the village of Umarathá, in Bhṛingáriká. The donation was for religious uses, and was transacted at Udayapura.‖ Umarathá was bounded on the east by Náha; on the south, by Vahiḍáuga; on the west, by Deulí; and on the north, by

* For this stanza, and its traditional history, see last year's Journal pp. 202, 203, foot-note. There is an error in the end of its third quarter, as engraved and printed. A common reading for what is there corrupted is यातो दिवं भूपते

† If the verb in this sentence means "ratified," or "counter-signed," it is without any classical warranty. The proper name is not over-distinct.

From the words यः कश्चिद्च * * * भवति, distinguishable after what is given above, I suspect that nothing is lost from the inscription, beyond a customary couplet, insisting, that its validity is not to be impugned on account of clerical deficiency or excess.

‡ Leading off his titles are words of which I can make nothing. A'madaṇahila may be a proper name.

Devapála, who calls himself Rájá, was reigning at Dhárá in A. D. 1353. See this Journal, for 1859, pp. 1—8. A Rájá Devapála has left his name carved in the Udayapura temple, with the date 1268 attached. If in S'aka, the time was A. D. 1346. Were Ajayapála and Devapála of the same family?

§ Circumstantially, on Monday, the third day of the light fortnight in Vais'ákha. That day is called *akshaya-tṛitiyá* and *yugádi*, as in the inscription. The term *yugádi*, "beginning of a cycle," is applied to four days in the year, the anniversaries of the commencements of the great cycles. The *yugádi* in question has reference to the *satya yuga*.

‖ The grant was, professedly, for the benefit of one Solaṇa, of blessed memory, son of Vilhaṇa, a Rájaputra, of the family of Muhila'uta. Solaṇa and Vilhaṇa may be supposed to have been father and grandfather of Lúṇapasáka.

The donor stipulates for the observance, in behalf of some unnamed idol, of ceremonies involving the ritual employment of sandal, flowers, incense, lights, and edibles.

Lakhṇa'uḍá. Lakaṭharási, a person bearing the title of Bhaṭṭáraka, who was somehow connected with the instrument of gift, is named at its conclusion.

Bháilla, now Bhelsá, was the designation, in past times, of a large territory. The region which included it, being ruled, in A. D. 1172, by Ajayapála, was, doubtless, a new kingdom that had grown out of the dismemberment of the realm once dominated by Udayáditya. The kings of Málava who succeeded Udayáditya between A. D. 1104, and 1215, were Naravarman, Yas'ovarman, Jayavarman, Vindhyavarman, Subhaṭavarman, and Arjuna; and no traces of their authority have come to light at Udayapura, or in its vicinity.

One day's march from Udayapura brought me to the place where I finish this paper. For the second time I have just read the old inscriptions here, in the column and on the gigantic stone boar. It has caused me no surprise to find, that my former decipherments of them admit of a few corrections.*

* See last year's Journal, pp. 14—22, and pp. 139—150.

In the opening stanza of the first inscription is a hiatus, the last letter before which I took to be न्य, and supplied accordingly what was missing. But it is स्य, indubitably. स्यन्दन, a euphemism for "destruction," may be proposed as the original reading.

Immediately preceding the name of Indravishṇu, I thought I saw ऋषभ. Through the mutilation of the engraving on the column, I now think I can make out वृषभ. On the boar, to be sure, where everything is very indistinct, there seems to be ऋ: but both the inscriptions must, almost to a certainty, here exhibit the same word.

Four months after my first visit to Eran, writing under the guidance of my facsimile copy, I said of what looked to me like *sansurabhu*, that it "is doubtful in its penultimate syllable, and very doubtful in its final." Mr. Prinsep's lection is *sansuratam*. The result of a close re-examination of the word as it stands on the stone is this. The final syllable is clearly *tri*. The penultimate, judged by what is left of it in its damaged state, could not well have contained any consonant but *k* or *r*. The vowel, if it had one, may have been *á*, *e*, or *o*. Possibly the word was *sansurátri*; and it may be a plausible theory, that it was the name of the country which had the Yamuná and the Narmadá for two of its boundaries. Or is it a repetition of the date; an abbreviation of *samvat*, followed by three literal symbols of arithmetical value? If I had access to Mr. Thomas's edition of Mr. Prinsep's *Indian Antiquities*, it might be easy to say whether this last suggestion is of any account.

For several months I have had by me a photograph of the inscription in the Gwalior Fort, for which I have to thank Colonel Cunningham. Its paleography seems to be a little more recent than that of the monuments at Eran. It speaks of a Toramáṇa, and of Mátricheṭa, son of Mátṛidása, son of Mátṛinula. A specimen of it here follows:

जयति जलदखेलं ध्वान्तमुत्सारयन् स्वैः
किरणनिवहजालैर्व्योम विद्योतयद्भिः।

Those who are interested in the preservation of Indian antiquities will be grieved to hear, that, during the last fourteen months, the writing on the column has suffered irreparable injury. The boys of the village have invented a new amusement, in throwing stones at it; and at least a dozen letters that were complete, when last I was here, are now for ever obliterated.

Camp Eran, Feb. 26, 1862.

उद्यनगतटाग्रं मण्डयन् यः खरांशुः
चकितगमनखेदभ्रान्तचञ्चच्छटाग्रैः ॥ १ ॥
उदयगिरिम आशायस्तचक्रार्तिहर्ता
भुवनभवनदीपः शर्वरीनाशहेतुः ।
तपितकनकवर्णैरंशुभिः पङ्कजानाम्
अभिनवरमणीयं यो विधत्ते स वोऽव्यात् ॥ २ ॥

1. "Triumphant is he who, with his massed net-work of rays, lighting up space, dispels the darkness, sportive as rain-clouds, and adorns the peaks of the Eastern Mountain with his hues, the points of whose tremulous lustre are distracted with weariness from journeying in alarm.

2. "May he who, going *daily* to the Eastern Mountain, removes the distress of ruddy geese longing *for the return of day;* the illuminator of earth, as it were a mansion; destroyer of night; who, by his rays, in colour like melted gold, *incessantly* supplies new embellishment to the water-lilies, protect you."

These lines come from a temple dedicated to the sun, to whom they are addressed. Poor in thought, they are also incorrect as to language. तपित is false Sanskrit for तप्त; and रमणीय is censurably used for रमणीयता. I do not apprehend, that the poetaster designed any the remotest allusion to the Udayagiri hill near Bhelsá.

The first letter that appears at the beginning of the inscription is a broken **य**; and nothing of **उद्यनग** remains except the **उ** and the shanks of the **ग**. But those are distinct.

To **उदयगिरि**, in the second stanza, I have added, from pure conjecture, **०ग आशा-**, as a substitute for stars. The third line shows an *upadhmáníya* before a **प**. In the teeth of all grammar, this, as lately edited, has been turned into a *repha;* and, further on, in what I do not print, **मातापितुस्तया**, most legibly photographed, has given place to **मातापितुस्तया**. Shade of S'áta-tápana! See last year's Journal, pp. 275, 276.

Rávaṇa's Commentary on the Ṛig Veda, by Fitz-Edward Hall, Esquire, D. C. L.

To the Secretary to the Asiatic Society of Bengal.

Bombay, April 11, 1862

Sir,—Accompanying this note I send, for the Journal, some extracts from a commentary on the *Ṛig-veda*, by one Rávaṇa. Time fails me to put into presentable shape for the press a translation of them, and remarks thereon, which I had hoped to communicate with the Sanskrit.

The extracts are contained in the *Paramártha-prapá*, a volume of scholia, by Súrya Pandit, on the *Bhagavad-gítá*. Some account of Súrya, who lived in the first half of the sixteenth century, will be found in my *Contribution towards an Index to the Bibliography of the Indian Philosophical Systems*, pp. 119, 120.* I have indicated numerically, by *maṇḍala*, *súkta*, and *ṛich*, the passages of the *Ṛig-veda* which are expounded.

That a Rávaṇa wrote annotations on some portion of the Veda, is hinted by Mallári. See the *Graha-lághava*, &c., Calcutta edition, p. 5. At Ajmere, at Gwalior, and elsewhere, pandits have, again and again, assured me of their having seen, and even of their having possessed, the whole of Rávaṇa's commentaries on the *Ṛig-veda* and *Yajur-veda*. And I hesitate to conclude, that herein they were cretizing; as I am unable to conceive why they should have wished to deceive me.

On the authority of the *Bháva-prakás'a*, by Bháva Mis'ra, son of Laṭakana Mis'ra, some Rávaṇa or other composed a *Kumára-tantra*. A work of like title, Bháva alleges, is ascribed to Sanatkumára.

Your obedient servant,

Fitz-Edward Hall.

* The extracts, now given, were originally printed in a preface to this work which was subsequently cancelled.

तद्विष्णोः परमं पदं सदा पश्यन्ति सूरयः। दिवीव चक्षुराततम्॥ १. २२. २०.।

तद्विप्रासो विपन्यवो जागृवांसः समिन्धते। विष्णोर्यत् परमं पदम्॥ १. २२. २१.।

अत्र रावणभाष्यम्। विष्णोर्व्यापनशीलस्याऽपि परमात्मनः। तत् परमं पारमार्थिकं पदं अभिव्यक्तिस्थानम्। दिवि मूर्ध्नि भ्रूमध्ये वर्तते। त्रिपादस्यामृतं दिवीतिश्रुतेः। सच्चिदानन्दात्मकं विष्णोः पदम्। तत् किम्। यत् सूरयो महानुभावाश्चक्षुराततं विस्तृतमिव कृत्वा सदा अव्यवधानेन पश्यन्ति निरन्तरं साक्षात् कुर्वन्ति। यद्वा चक्षुरर्थप्रकाशकम्। इव एवकारार्थे। आततमपरिच्छिन्नमेव यथा स्यात् तथा पश्यन्ति। तत् तस्मात्। विप्रासो विप्राः श्रेष्ठमतयः। विपन्यवो मेधाविनः। जागराच्चकुरिति जागृवांसः दृश्यप्रपञ्चाद् दीर्घस्वप्नात् सकाशात् जागरं प्राप्ता इत्यर्थः। प्रोक्तवदनुभूयमानं पदं समिन्धते सन्दिदं नयन्ति सर्वात्मकत्वेन पश्यन्ति। अयमेतदुक्तं भवति। अभ्यासदशायां सुषुम्नाविवरेण भ्रूमध्यं प्रापितया दृष्ट्या पश्यन्ति। व्यवहारदशायां तु सकलविषयप्रतीतिरूपेण तदेव पश्यन्तीत्यर्थः।

द्वा सुपर्णा सयुजा सखाया समानं वृक्षं परिषस्वजाते। तयोरन्यः पिप्पलं स्वाद्वत्त्यनश्नन्नन्यो अभि चाकशीति॥ १. १६४. २०.।

रावणभाष्यम्। अत्र लौकिकप्रसिद्धा दृष्टान्तेन जीवपरमात्मानौ रूप्येते। यथा लोके द्वौ सुपर्णौ सुपतनौ शोभनगमनौ सयुजा समानयोगौ सखाया समानख्यानौ समानं वृक्षं एकं देहाकारवृक्षं परिषस्वजाते आश्रयतः। तयोरन्यः एकः पिप्पलं फलं स्वादुतरमत्ति। अपरः अनश्नन् अभिचाकशीति अभिपश्यति। तद्वत् द्वौ सुपर्णस्थानीयौ चेतनपरमात्मानौ सयुजा समानयोगौ। योगो नाम सम्बन्धः। स च तादात्म्यलक्षणः। स एव आत्मा जीवात्मनः स्वरूपं एवमन्यस्याऽपि इत्येकात्म्यम्। अतएव सखायौ समानख्यानौ। यस्य यादृशं ख्यान

स्फुरणं परमात्मनः तदेवेतरस्याऽपि। अतएव सखायौ एकरूपप्रकाशावित्यर्थः।

युवा सुवासाः परिवीत आगात् स उ श्रेयान् भवति जायमानः।
तं धीरासः कवय उन्नयन्ति स्वाध्योऽमनसा देवयन्तः॥ ३. ८. ४.।

रावणभाष्यम्। बाल्यवार्धक्याद्यैर्देहविकारैर्विरहितः युवा मुख्यप्राणः। सुष्ठु वासः प्रावरणं यस्य सत्त्वाकारान्तःकरणवृत्तिप्रतिबिम्बितशरीरादृतः सन्। आगात् जीवदशां प्राप्तः। उ इति निश्चयेन। स जायमानः प्रादुर्भूतः सन् सत्कर्मनिरतो भवति। स स्वाध्यः सुखेनाऽऽराध्यः। तमेवंविधम्। धीरासः दृढव्रताः। कवयः क्रान्तदर्शिनो ज्ञानिनः। देवयन्तो देवत्वं प्राप्तुमिच्छन्तः। मनसा सह उन्नयन्ति सुषुम्नाविवरेण ऊर्ध्वं नयन्ति।

यस्तित्याज सचिविदं सखायं न तस्य वाच्यपि भागो अस्ति।
यदीं शृणोत्यलकं शृणोति न हि प्रवेद सुकृतस्य पन्थाम्॥ १०. ७१. ६.।

रावणभाष्यम्। अत्र सचिशब्दः सखिवाची। सचीन् सखीन् परमप्रेमास्पदान् विषयान् वेत्तीति सचिवित्। तमुपकारकम्। अतएव सखायं परमात्मानम्। यः पुरुषः तित्याज त्यक्तवान्। आत्मबहिर्मुख इत्यर्थः। तस्य पवनात्मिकायामपि वाचि सत्यत्वभागो नाऽस्ति। किंपुनर् जल्परूपायाम्। तथा ईम् इत्ययं बहिर्मुखः यच्छृणोति शास्त्रश्रवणं करोति। तदलकमलीकमसत्यम्। हि यस्मात् कारणात्। स सुकृतस्य सत्यस्य ब्रह्मणः। पन्थां पन्थानं मार्गम्। न प्रवेद न जानाति। तथा मुह्यन्त्यन्ये अभितो जनासः। इहाऽस्माकं मघवा सूरिरस्त्विति।

हृदा तष्टेषु मनसो जवेषु यद्ब्राह्मणाः संयजन्ते सखायः।
अत्राऽहत्वं विजहुर्वेद्याभिरोहब्रह्माणो विचरन्त्यु त्वे ॥

१०. ७१. ८.।

इमे ये नार्वाङ् न परश्चरन्ति न ब्राह्मणासो न सुतेकरासः। त एते वाचमभिपद्य पापया सिरीस्तन्त्रं तन्वते अप्रजज्ञयः ॥ १०. ७१. ९.।

रावणभाष्यम्। हृदा बुद्धिरूपेण मनसा। तष्टेषु निराकृतेषु। मनसो जवेषु वृत्तिरूपेषु मनोवेगेषु सत्सु। यत् यस्मात् कारणात्। ब्राह्मणाः ब्रह्मज्ञाः। सखायः सर्वभूतसुहृत्तमाः सन्तः। सम्यक्प्रकारेण यजन्ते। अन्तर्यागं कुर्वते। तत्राऽन्तर्यागे क्रियमाणे किं भवतीत्याह। अत्रेति। अत्र अह त्वं इति पदविभागे अहेत्यत्राऽनुस्वारलोपश्छान्दसः अहन्त्वं विजज्ञुः अन्तर्यागेन भेदभावनां त्यक्तवन्तः। किम्भूताः वेद्याभिर्विद्याभिः ज्ञानवृत्तिभिः। अभि ऊह्यं ब्रह्म यैस्ते। पदार्थप्रतीतिरूपेण ज्ञातब्रह्माणः सन्तः। उ इति निर्धारणे। त्वे एकत्वे। विचरन्ति अखण्डैकरसत्वेन व्यवहरन्ति। तदुक्तमागमेऽपि।

स्वाधिष्ठानगते कुण्ड चिद्रूपं वह्निमुज्ज्वलेत्।
जुहुयात् प्रणवेनात्र त्वमहन्तां निवेदयेत् ॥
आत्मन्याऽऽत्मानमद्वैते भूत्वा सच्चित्सुखात्मकः।
स्थीयते यत् क्रियत्कालं सोऽन्तर्यागः स्मृतो बुधैः ॥ इति।

इमे य इति। इमे ये उक्तलक्षणाः पुरुषाः ते। अर्वाङ् मनुष्यलोके। न चरन्ति न सम्भवन्ति। न पर इति सकारान्तमव्ययम्। परस्मिन् देवलोकेऽपि नोत्पद्यन्ते। कृताकृतैः कर्मभिरुत्तमाधमलोकं न गच्छन्ति किन्त्वत्रैव ब्रह्मीभूतास्तिष्ठन्तीत्यर्थः। न तस्य प्राणा उत्क्रामन्त्यत्रैव समवलीयन्त इति श्रुतेः। परन्तु ब्राह्मणाः जातिमात्रविप्राः। तथा सुतं सोमम् अभिषुतं कुर्वन्तीति सुतेकरास्त एव सुतेकरासो याज्ञिकास्तथा न भवन्ति। किन्तु ते उत्तमाधमगतिं प्राप्नुवन्त्येवेत्यर्थः। अत्र हेतुमाह। त एत इति। त एते निरूपितप्रकारा ब्राह्मणाः सुतेकराश्च। वाचं फलप्रतिपादिकाम् वेदवाणीम्। अभिपद्य ज्ञात्वा। सिरीः *सारिणः क्षुरिकर्तार इव भूत्वा पापया फला-

* सारिणः ? Eds.

ग्रया। तन्वं यज्ञादिकं तन्वते विस्तारयन्ति। अतएव अप्रजस्त्वयः न प्रहृष्टा जन्तिः जन्म एषां ते अप्रहृष्टजन्मान इत्यर्थः।

सर्वे नन्दन्ति यशसागतेन सभासाहेन सख्या सखायः।
१०. ७१. १०.।

रावणभाष्यम्। न तस्य प्रतिमाऽस्ति तस्य नाम महद् यश इति श्रुतेः यशसा परमात्मना। आगतेन प्राप्तेन। सर्वे देहिनो नन्दन्ति। परमानन्दाप्लुता भवन्ति। किम्भूतेन सभासाहेन सभामिन्द्रिय-सभां लौकिकव्यवहारं वा सहते आक्रमते तथाविधेन। पुनः किम्भूतेन सख्या उपकारकेण। किम्भूताः सर्वे सखायः सर्वभूतसुहृत्तमाः। तथा च सर्वभूतसुहृत्तमत्वमेवाऽऽत्मप्राप्तेर्निदानम्। न तूत्तमाधमत्व-मिति।

आविर्भून् महि माघोनमेषां विश्वं जीवं तमसो निरमोचि।
महि ज्योतिः पितृभिर्दत्तमागादुरुः पन्था दक्षिणाया अदर्शि॥ १०. १०७. १.।

अत्र रावणभाष्यम्। एषामाचार्याणां माघोनं महि आविरभूत्। इन्दति जानाति इति व्युत्पत्त्या मघोन इन्द्रस्य परमात्मन इदं माघो-नम्। महि महत्त्वम्। आविरभूत् आविर्भूतं। कुत इत्यत आह। महीति। महि महत्त्वम्। ज्योतिर्ज्ञानं पितृभिरस्माभिर्दत्तं सत् आगात् प्राप्तम्। तेष्वाचार्येषु परिणतम्। येन ज्योतिषा विश्वं जीवं सर्वं जगत्। तमसोऽज्ञानात् निरमोचि निर्मोचितम्। अथ कथम-स्माभिस्तेभ्य एवार्पितमित्याह। तैः उरुर्निरवधिकफलो दक्षिणायाः पन्था मार्गः अदर्शि दृष्टः। मोक्षार्थिभ्य आत्माख्यदक्षिणाया मार्गस्य फलं निरवधिकमिति ज्ञातमित्यर्थः।

चतुष्कपर्दा युवतिः सुपेशा घृतप्रतीका वयुनानि वस्ते।
तस्यां सुपर्णा वृषणा निषेदतुर्यत्र देवा दधिरे भाग-धेयम्॥ १०. ११४. ३.।
एकः सुपर्णः स समुद्रमाविवेश स इदं विश्वं भुवनं

विचष्टे। तं पाकेन मनसा ऽपश्यमन्तितस्तं माता रेल्हि स उ रेल्हि मातरम् ॥ १०. ११४. ४. ।

रावणभाष्यम्। चत्वारः कपर्दा उत्कर्षा यस्याः सा चतुष्कपर्दा पूर्वोपक्रान्ता माया। अथ तानेवोत्कर्षानाऽऽह। युवतिरित्यादि। युवतिः सदा तरुणी। कदाऽपि वार्धकं न प्राप्नोति। अयमेक उत्कर्षः। तथा सुपेशा सुतरां पेशा सुपेशा कुशला अघटनघटनापटीयसी। तदुक्तम्।

यथा स्वप्नमुहूर्ते स्यात् संवत्सरशतभ्रमः।
तथा मायाविलासोऽयं जायते जायतिभ्रमः ॥ इति।
अविद्या च तथा विद्या जीव ईश्वर एव च।
तत्कृतौ बन्धमोक्षौ च षडस्माकमनादयः ॥ इति।

अयं द्वितीय उत्कर्षः। तथा घृतप्रतीका घृतवन्निष्टं प्रतीकमुपक्रमो यस्याः सा परिणामे विशेषमेत्यर्थः। अयमेव तृतीय उत्कर्षः। तथा वयुनानीति वयुनानि ज्ञानानि। वस्ते छादयति। तद्विपरीतस्वभावत्वात्। तर्हि चतुरुत्कर्षवती मायैवाऽस्ति कथमीश्वरप्रसिद्धिरित्याह। तस्यामिति। तस्यामुक्तलक्षणायां मायायाम्। सुपर्णा सुपर्णौ शोभनपतनौ। जीवेश्वरौ। पक्षिणाविव वृक्षौ सदसत्फलवर्षितारौ। द्विवचनस्य वा छन्दसीत्वात्वम्। निषेदतुर्निषसौ स्थितौ। कुतो ज्ञातमेतदत आह। यच्चेति। यच्चत्वं भागधेयमर्थप्रकाशसामर्थ्यम्। द्योतयन्त्यर्थान् प्रकाशयन्ति। ते देवाश्चक्षुरादयः। दधिरे धृतवन्तः। अनेन ज्ञाननिरोधनकर्त्र्या मायायाः सकाशात्। ईश्वरस्य वैलक्षण्यं द्योतितम्। अथ सुपर्णाविति द्विवचनेनेश्वरस्य द्वैविध्यमापन्नम्। तत् परिहरति। एक इति। वस्तुतः सुपर्ण एक एव। स समुद्रमाविवेश समुदयति तिरोधत्ते। एवंविधं प्रपञ्चमाविवेश। तत् सृष्ट्वा प्राविशदिति श्रुतेः। स इदं भुवनं स्थूलप्रपञ्चभूतम्। विचष्टे ज्ञातवान्। तं पाकेन परिपक्वेन बुद्धिरूपेण मनसा। अन्तितः अभ्यन्तरतः। यावदपश्यमद्राक्षं तावत् तं सुपर्णम्। माता माया। रेल्हि। लिह आस्वादने। विसर्गेति (?) विसृजति त्यजति। तथा उ इति निश्चितम्। सुपर्णः मातरं विसृजति। द्विवचनं तु तादात्म्यविषयकम्। अतएव अग्रतो वक्ष्यति। सुपर्णं विप्राः कवयो वचोभिरेकं सन्तं बहुधा कल्पयन्तीत्यादि।

Contributions to Indian Malacology, No. III. Descriptions of new operculated land-shells from Pegu, Arakan and the Khasi hills.*— By William T. Blanford, F. G. S.

1. Alycæus Ingrami, *n. s.*

Testa late umbilicata, conoideo-depressa, acute sinuato-costulata, albida, interdum rubello-albida, versus apicem ferruginea, vix translucens. Spira conoidea, apice obtusula, sutura parum profunda. Anfr. 4 convexi, ultimus ad peripheriam sub compressus, ad latus mediocriter tumidus, ibidem confertissime costulatus, tum constrictus, prope aperturam non descendens. Spatium constrictum† longitudinis mediocris, costulatum, medio tumidum; tubulum suturale mediocre, ¼ peripheriæ subæquans. Apertura obliqua, circularis: peristoma duplex; externo breviter incrassato-expanso; interno expansiusculo, continuo. Operculum fuseo-corneum, multispirum, externe pereoncavum, nucleo centrali intus prominente papillari.

	millemetres		inch
Diam. maj.	6	or	0.24
„ min.	5		0.2
Alt.	3¼		0.13
Aper. diam.	1¾		0.07

Habitat prope Tongoop in Arakan.

The present belongs to the typical group of *Alycæus*, according to Mr. Benson, and is most nearly allied to *A. umbonalis*, B. from Pegu. It is distinguished from that species by its more raised spire, smaller size, shorter sutural tube, and shallower suture, by its less oblique mouth and non-descending last whorl, and by its duplex slightly expanded peristome, which contrasts strongly with the broadly reversed lip of *A. umbonalis*. That species also has the upper whorls much more closely, but less sinuously costulated than are those of *A. Ingrami*. In the subangulation of the last whorl at the periphery there is some resemblance to the little Thayet Myo *A.*

* My brother having left India, I have no longer the advantage of his co-operation in the publication of these "contributions." In consequence of his absence, I fear that I shall be unable in future to add drawings of the shells described.

† By *Spatium constrictum* or *strictura* in these descriptions of *Alycæi*, the whole constricted space from the peristome to the origin of the sutural tube is to be understood.

sculptilis, B. which, however, is easily distinguished by the characters of its crenulated peristome, besides other peculiarities.

The *Alycæus* from the Andaman islands lately described by Mr. Benson (Ann. and Mag. Nat. Hist. for January, 1861) probably resembles *A. Ingrami* in size and general shape. I have not had the opportunity of seeing *A. Andamaniæ*, B. which is, however, clearly distinct from the present species on account of the characters of the spire, suture, sculpture, &c.

I have much pleasure in naming this form after Captain Ingram, to whom I am indebted for a very large collection of shells, chiefly from Arakan and the Arakan hills, and embracing altogether about 50 species, several of which had escaped my own search.

A. Ingrami was found in only one spot, viz. in earth at the sides of a large mass of limestone about 3 miles S. W. of Tongoop. There it was abundant.

2. Alycæus humilis, *n. s.*

Testa aperte umbilicata, turbinato-depressa, lævis, rubello-succinea, ad apicem sanguinea. Spira conoidea, apice obtusula, sutura profunda. Anfr. $3\frac{1}{2}$ rotundati, ultimus ad latus mediocriter inflatus et confertim costulatus, tum constrictus, versus aperturam breviter descendens. Strictura glabra, longa, antice tumidior. Tubulum suturale breve, $\frac{1}{6}$ peripheriæ subæquans. Apertura obliqua, circularis; peristoma duplex; externo retro-relicto, interno continuo, porrecto, fere soluto. Operculum corneum, multispirum, externe concavum.

	mm.		inch
Diam. maj.	$2\frac{1}{2}$	or	0.1
„ min.	2		0.08
Alt.	$1\frac{1}{2}$		0.06
Apert. diam.	$\frac{2}{3}$		0.025

Hab. ad Akouktoung, ad ripas fluminis Irawaddi, in provincia Burmana Pegu.

A solitary specimen of this species, slightly weathered and shewing more sculpture than usual, was found by me in April, 1861, close to Myanoung, on the banks of the Irrawaddy. With it I found a few other shells; amongst them a small variety of *Bulimus cænopictus*, Hutt. and as this shell is not known to inhabit Pegu, but has since occurred to me in the neighbourhood of Ava, I was inclined to suppose that *A. humilis* was also derived from that neighbourhood.

Lately, however, during a hurried search at Akouktoung, I had the good fortune to find some living specimens of what, I have little doubt, is the same species as that which I first obtained, the only difference being the absence of any sculpture except on the tumid portion of the last whorl. From those specimens the above description has been corrected.

A. humilis resembles somewhat the minute *A. armillatus*, B. but differs in the very much greater distance to which the strongly marked costulation upon the tumid portion of the last whorl is carried back from the constriction, the distance being in both species proportional to the length of the sutural tube. *A. humilis* is further distinguished by its longer constriction, by the descent of the mouth, and the greater tumidity of the last whorl. The colour, as in many *Alycæi*, is probably not quite constant, some specimens being white and translucent.

With *A. humilis* at Myanoung I found a single broken specimen of another *Alycæus* which resembles the singular little Darjiling *A. plectocheilus* in the form of the peristome. The specimen being imperfect and weathered, I delay publishing a description of it in the hopes of succeeding in obtaining better specimens before doing so.*

3. Alycæus graphicus, *n. s.*

Testa perforata, ovato-globosa, tenuis, pallide fulva, costulis filaribus subremotis sinuatis ornata. Spira ovato-conoidea, lateribus convexis, apice obtusula, sutura impressa. Anfr. 4, rotundati, 2 primi lente, penultimus et ultimus celerius accrescentes, ultimus ad latus vix tumidus, pone strictura spatio brevissimo confertius costulatus, tubulum suturale brevissimum gerens. Spatium constrictum læve, costulâ filiformi unâ medio plerumque signatum, prope aperturam tumidius. Apertura vix obliqua, majuscula, circularis; peristoma duplex; interno breviter porrecto, continuo; externo expanso, retro relicto, ad umbilicum reflexo, perforationem partim celante.

	mm.		inch
Diam. maj.	3	or	0.12
„ min.	$2\frac{1}{2}$		0.1
Alt.	3		0.12
Apert. diam.	$1\frac{1}{3}$		0.06

* It is perhaps the same as a species since found in Upper Burma.

Habitat in montibus Arakanensibus provinciam Burmanam Pegu ab Arakan secernentibus.

A Burmese representative of the little Darjiling group of *Alycæi*, which comprises *A. constrictus*, B. *A. Bembex*, B. and *A. Otiphorus*, B. *A. graphicus*, although much more globose than any of the others, is in some respects intermediate between *constrictus* and *Otiphorus*, resembling the first in size and somewhat in form, and the latter in the reflexed left edge of the outer peristome. This character, however, is by no means so much developed in the Burmese as in the Darjiling species. The present has a more marked sculpture than either of its three allies and differs from them also in the very slight approximation of the costulation behind the constriction. Almost all the species of the genus *Alycæus*, are more closely and strongly marked upon the tumid portion of the last whorl than on any other part of the shell, the length of the closer ribbing and of the tumidity having a general relation to that of the sutural tube.*

Several dead specimens of *A. graphicus* were found at Moditoung, a halting-place about 55 miles from Prome, on the road across the uninhabited Arakan Yoma range from that place to Tongoop.

4. Alycæus vestitus, *n. s.*

Testa subanguste umbilicata, turbinata, solida, epidermide deciduâ, crassâ, subtestaceâ, sordide albidâ, conferte, ad spatium inflatum confertissime costulatâ, induta, sub epidermide rubella, lævis, spatio inflato costulato-striata. Spira conoidea, apice obtusa, sutura impressa. Anfr. 4½ rotundati, ultimus teres, ad latus parum inflatus. Strictura brevis, versus aperturam vix tumidior. Tubulum suturale mediocre. Apertura fere verticalis, circularis, majuscula: peristoma duplex; interno continuo, externo expansulo, ab interno sulco separato, ad anfr. penultimum breviter interrupto.

	mm.	inch
Diam. maj.	5	or 0.2
,, min.	3½	0.14
Alt. vix	3	0.12
Apert. diam.	1⅓	0.06

Hab. in montibus Arakanensibus.

Var. minor. Diam. maj. 4, min. 3, Alt. 2¼ m.m.

* *A. otiphorus*, B. is not costulated, but simply, closely and regularly striated throughout, rather more closely and costulately on the inflation.

Hab. cum *A. graphico* ad Moditoung.

But a single specimen of each variety was found. The first was obtained on the banks of the Pado Khyoung, a stream running from the Arakan range on the Pegu side in the district of Henzada. A single specimen either of another variety, or of a distinct but closely allied species occurred to me on the banks of another stream, the Alon Khyoung, lying between the two previously mentioned localities. This form differs in having a simple lip, and, apparently, a longer sutural tube. None of the specimens are quite fresh, although all are in fair condition and unbleached. Of the epidermis only traces remain on both shells.

This species is not affined to any known form. It is perhaps nearer to the little group to which *A. graphicus* belongs than to any other, but it has not the short sutural tube nor the ovately conoid form which characterizes that section of the genus. The shortness of the constriction, and the very slight degree in which it expands towards the aperture, connect this form somewhat with the section *Dioryx* of Mr. Benson.

5. Alycæus succineus, *n. s.*

Testa aperte umbilicata, depresso-turbinata, acute sinuato-costulata, succinea, translucens. Spira conoidea, apice obtusula, sutura impressa. Anfr. 4, ultimus ad latus inflatus, ibidem confertissime costulatus. Strictura longa, medio tumida, et duobus vel tribus costulis obliquis, sulculis internis correspondentibus, signata. Tubulum suturale mediocre, $\frac{1}{4}$ peripheriæ subæquans. Apertura obliqua, irregulariter circularis, superne subangulata: peristoma duplex; interno continuo, incrassato, expansulo, margine dextro bis obtuse angulato, ad basin canaliculo haud intrante perforato; externo breviter expanso, retro relicto.

	mm.		inch
Diam. maj.	5	or	0.2
„ min.	4		0.16
Alt.	$3\frac{1}{4}$		0.13
Ap. diam.	$1\frac{1}{2}$		0.06

Habitat in montibus Arakanensibus.

Some of the peculiarities of this species, such as the canaliculate base of the peristome, and the two or three small plaits on the constrictions are repeated in that next described. The plaits or ridges

just referred to, although they have corresponding internal hollows, are scarcely so prominent as those forming the sculpture of the upper portion of the shell. They are nearer to the mouth than to the rise of the sutural tube, and rest upon a tumidity which is scarcely sufficiently pronounced to enable the species to be assigned to the section *Charax* of Benson, although it exactly represents the well marked ridge in the undermentioned species *A. polygonoma*. The sutural tube is, in one specimen, somewhat short of the typical length.

Of *A. succineus*, I only obtained 4 specimens. They occurred at Moditoung together with *A. graphicus*, &c. All were dead, but in fresh condition.

6. Alycæus polygonoma, *n. s.*

Testa aperte et perspective umbilicata, turbinata, radiato-striata, rubello-succinea. Spira conica, apice obtusula, sutura profunda. Anfr. 4 rotundati, ultimus ad latus valde inflatus, ibidem confertissime et acute costulatus; spatium constrictum longitudinis mediocris, costulato-striatum, medio in costam prominentem, intus cavo-sulcatam, 2 vel 3 costulis signatam, tumescens. Tubulum suturale mediocre, $\frac{1}{4}$ peripheriæ subæquans. Apertura obliqua, polygonali-circularis, basi valde antice sinuata; peristoma duplex; interno vix porrecto, margine dextro ter subangulato, basi subcanaliculato; externo incrassato-expansulo, processu brevi, acuto, basali munito.

	mm.		inch
Diam. maj.	5	or	0.2
„ min.	$4\frac{1}{4}$		0.17
Alt.	$3\frac{1}{2}$		0.14
Ap. diam.	$1\frac{3}{4}$		0.07

Hab. in montibus Arakanensibus.

This species is allied to the last described but is distinguished by its higher spire, less marked sculpture, by the strong ridge on the constriction, and by the more polygonal aperture. The incision of the base, however, is slighter, and, in this species, accompanied by a slight corresponding projection beneath, which represents, on a small scale, the large ear-like basal process in *A. prosectus* Bens. from the Khasi Hills. The inner peristome of that species also has a slight basal indentation within the aperture.

I am indebted for a few perfect specimens of this species to Captain Ingram, who found them upon the Western side of the Arakan range.

I obtained one imperfect specimen at Shoukbeng on the Promc and Tongoop road, close to the summit of the hills.

7. Alycæus nitidus, *n. s.*

Testa anguste umbilicata, depresse turbinata, solidula, fulvo-cornea, nitida, polita, translucens. Spira conoidea, lateribus convexis, apice obtusa, sutura impressa. Anfr. 4 convexi, ultimus ad peripheriam subangulato-compressus, subtus planulato-convexus, ad latus breviter tumidus, ibidem confertissime costulatus. Spatium constrictum longum, nitidum, lirâ retro-recumbente, parum elevatâ, prope regionem inflatam munitum. Tubulum suturale breve. Apertura diagonalis, undata, circularis. Peristoma ad basin antice, superne prope anfractum penultimum retro sinuatum, duplex; interno continuo, breviter porrecto, basi canaliculato; externo expanso, retro relicto, in processum auriformem subtus producto. Operc. tenue, corneum, multispirum.

	mm.	inch
Diam. maj.	$3\frac{1}{3}$	or 0.14
„ min.	3	0.12
Alt.	$2\frac{1}{3}$	0.09
Ap. diam.	1	0.04

Hab. prope Tongoop in Arakan.

This very pretty and distinct little species occurred rarely at the roots of trees near Thaloo and Bandiyo, on the Prome and Tongoop road, not far from the last-named place. It combines the canaliculate inner peristome of *A. succineus* with an ear-shaped process like that at the base of *A. polygonoma*, while the ridge on the peristome is curved backwards in a similar manner to that in *A. hebes*, Bens. *A. gemmula*, Bens. and *A. Footei*, Blanf. although much less elevated than in either of those species, to which the shell now described has otherwise but little resemblance. The somewhat flattened base is peculiar.

The preceding 7 species shew how numerous must be the forms belonging to this peculiar and well marked little genus. Ten species, including *A. umbonalis, armillatus* and *sculptilis* of Mr. Benson, have now been described from the partially explored provinces of Pegu and Arakan.*

* Since the above was written I have obtained 2 more species from Upper Burma.

8. Alycæus Theobaldi, *n. s.*

Testa aperte umbilicata, conoideo-depressa, corneo-albida, translucens, costulis elevatis, sinuatis, remotis ornata, inter costulas striatula. Spira depresso-conica, apice obtusula, sutura impressa. Anfractus $3\frac{1}{2}$ convexi, ultimus ad latus mediocriter tumidus, ibidem confertissime costulatus. Spatium constrictum longum, striatulum, medio tumidum. Tubulum suturale mediocre, $\frac{1}{4}$ peripheriæ subæquans. Apertura obliqua, expandens, circularis; peristoma ad anfractum penultimum breviter interruptum, marginibus callo junctis, duplex; externo expansulo, interno breviter porrecto. Operc: corneum, multispirum, externe perconcavum, nucleo centrali interno prominente papillari.

	mm.		inch
Diam. maj.	4	or	0.16
Do. min.	$3\frac{1}{4}$		0.13
Alt.	$2\frac{1}{2}$		0.1
Ap. diam.	$1\frac{1}{4}$		0.05

Hab. cum A. hebeti in montibus Khasi, teste W. Theobald, Jun.

I received two specimens of this species from Mr. Theobald as *A. hebes*, Bens. of which they were supposed to be young shells. They, however, prove, on closer examination, to be fully grown and distinct, the slight swelling in the centre of the constriction contrasting strongly with the high recurved ridge in *A. hebes*. This alone would shew the present to be a different species, but it is also distinguished by its lower spire, narrower umbilicus, smaller size, and thinner and interrupted peristome, the last character not occurring in any other species of the genus. The well-marked distant costulation of the upper whorls of *A. Theobaldi* is entirely wanting in *A. hebes*. The operculum of the latter does not appear to have been described. A single specimen in my possession is dark horny, indistinctly multispiral, extremely concave in front, and convex, almost conical, behind, and deficient in the central internal boss so prominent in most *Alycæi*.

Although there is a swelling in the centre of the constriction in *A. Theobaldi*, it does not amount to a marked ridge, such as characterizes the typical forms of the section *Charax* of Mr. Benson, e. g. *A. stylifer*, B. It is consequently not clear whether this species should be classed with the members of that section, or with those of

the typical group. Several species indeed tend to connect these two subdivisions, which more recent discoveries have rendered less distinct than they appeared to be when first described.

9. Cyclophorus patens, *n. s.*

Testa subanguste umbilicata, globoso-turbinata, nitida, subglabra, oblique striatula, subtilissime decussata, albida, plerumque obsolete fulvo-strigata, fasciâ unicâ, 2-3 m.m. latâ, nigricante castaneâ, infra peripheriam circumdata; rarius superne purpurascenti-castaneo-picta vel strigata, subtus castanea, periomphalo solo albido. Spira conica apice acutiuscula, sutura impressa. Anfr. 5-5½ convexi, ultimus rotundatus, vix descendens; umbilicus pervius. Apertura fere verticalis, circularis, intus flaveola, peristoma simplex, breviter adnatum, sublate angulatim planulato-expansum, margine columellari reflexum, fulvum, læte aurantiacum vel flammeum. Operc. distincte 6-spiratum, corneum, nucleo centrali interno minime prominente

	m.m.	inches		m.m.	inches
Diam. maj. (exempli majoris,)	38	or 1.5	minoris,	29	or 1.15
„ min. „	29	1.1	„	21	0.82
Alt.	26	1	„	19	0.75
Ap. diam. intus,	17	0.6	„	13	0.5

Hab. circa Thayet Myo, Prome, et Henzada in provinciâ Pegu.

This species is remarkable for its flat, disk-shaped expanded peristome, usually of a bright orange or scarlet colour, and for the absence of marked sculpture, and, in most specimens, of any conspicuous coloration, except a single broad dark chesnut stripe below the periphery.

10. Diplommatina sperata, *n. s.*

Testa dextrorsa, non rimata, ovato-conica, subfusiformis, solidiuscula, pallide cornea, subremote verticaliter costulata. Spira conica, apice acuta, sutura impressa. Anfr. 6½ convexi; antepenultimus major, tumidus; ultimus antice vix ascendens. Apertura verticalis, subtus antice sinuata, late auricularis, plicâ columellari validâ munita; perist: subduplex, expansum, margine columellari sinuato et ad basin angulo acuto desinente, callo parietali mediocri.

	m.m.		inch
Long.	2⅓	or	0.09
Diam.	1⅓		0.05
Ap. diam.	½		0.02

Hab. in montibus Arakan a Pegu secernentibus.

But two perfect specimens of this shell occurred to me at Moditoung on the Prome and Tongoop road, together with *Alycæus graphicus*, &c. It resembles *D. pachycheilus*, B. in the shape of the mouth, but is distinguished by the slighter rise of the last whorl, and by its subremote costulate sculpture, which, together with its less rounded aperture, serves also to distinguish it from *D. diplocheilus*, B. *D. pullula*, B. and *D. Blanfordiana*, B. the two latter of which are closely costulated, and the first named smooth.

I have met with two other species of *Diplommatina* in Pegu, both apparently undescribed.* The genus had not previously been met with in the Burmese peninsula.

During the past year (1861) I have found *Hydrocena pyxis*, B. as far South as the neighbourhood of Henzada. *Cyclophorus fulguratus*, Pfeiffer, *C. Theobaldianus*, B. and *C. patens*, appear to occur, the former abundantly, the others sparingly, throughout the greaterr portion of Pegu, west of the Irrawaddy. A small *Pupina* is common at Thondoung near Thayet Myo and in several places furthe south.

Leptopoma aspirans, B. occurs among Captain Ingram's Arakan collections. Two large species of *Cyclophorus*, one of which may perhaps be a variety of *C. aurantiacus*, Schum. were found near Tongoop. A solitary specimen of a small *Helicina*, allied to *H. Andamanica*, B. was obtained from Ramri Island.†

Thayet Myo, August, 1861.

Since the above paper has been written, undescribed forms have accumulated upon my hands. Of these the most interesting are a second species of the genus *Hypsclostoma* from Ava, whence I have also had the good fortune to obtain two more *Alycæi* and two *Diplommatinæ*, as well as a very singular little operculate shell allied to the anomalous *Pterocyclos hispidus*, Pearson. Two new species of *Helix* of the section *plectopylis* of Benson have also occurred to me and a very considerable number of other novelties.

Bassein, March, 1862.

* Two other distinct species have since been obtained in Upper Burma.

† Both *Leptopoma aspirans* and the small *Helicina* referred to above, have since been found abundantly in the South Western extremity of Pegu. They are there associated with the Darjiling and Khasi *Helix plectostoma*, B.

ERRATA

In Contributions to Indian Malacology, No. II. Vol. XXX. pp. 347d—366.

Page	*Line*	
347*d*	24	from top *for* Madras and Calcutta *read* Madras to Calcutta.
„	25	from top and p. 348 line 5 from top *for* Alycœus *read* Alycæus.
348	8	from bottom *for* anfractos intenos *read* anfractus internos.
349	2	from top *for* recumbentem ; peristomatis *read* recumbentem, peristomatis.
„	4	from top *for* sutaralis *read* suturalis.
„	14	from bottom *for* 40 *read* 30.
„	8	from bottom *for* Pl. I. fig. 4 *read* Pl. I. fig. 6.
„	5	from bottom *for* Aufr. *read* Anfr.
„	2	from bottom *for* perist-rectum *read* perist. rectum.
350	6	from top *for* flammeus *read* flammeus.
„	13	from bottom *for* Leptopmas *read* Leptopomas.
351	18	from top *for* rubeola *read* nitida.
„	„	from top *for* acutinscuta *read* acutinscula.
352	4	from top Cyclotus Kalryenensis is a Cyathopoma like C. filocinctus and C. Malabaricus.
„	11	from bottom *for* globosa turbinata *read* globoso-turbinata.
„	9	from bottom *for* accescentes *read* accrescentes.
354	11	from top *for* bark *read* back.
„	15	from bottom *for* aport *read* apert.
355	6	from top after medianis *read* circumdatus.
„	13	from top *for* cogeners *read* congeners.
357	4	from top *for* sucuriformis *read* securiformis.
„	23	from top *for* perpheriam *read* peripheriam.
„	25	from top *for* columellari breviter reflexo, marginibus remotis *read* marginibus remotis, columellari breviter reflexo.
359	3, 8, 15 and 22	also p. 364 lines 7, 8, 18 and p. 366 line 5 from bottom *for* Perotteti *read* Perrotteti.
„	14	from bottom *for* superiori *read* superiores.
„	13	from bottom *for* inferiori *read* inferiores.
„	„	from bottom *for* subplanati *read* subplanulati.
	12	from bottom *for* subequans *read* subæquans.
„	3	from bottom *for* Pierrei *read* Pirriei.
360	7	from top *for* lutia albida *read* luteo-albida.
361	9	from top *for* obliquily *read* obliquely.
363	5	from top *for* simicircularis *read* semicircularis.
„	15	from top *for* Nungumbankum *read* Nungumbaukum.
„	8	from bottom *for* Pteroryclos *read* Pterocyclos.
365	14	from top *for* nilagrica *read* nilagarica.
366	13	from top *for* Dipplommatina *read* Diplommatina.
„	18	from bottom *for* tricainata *read* tricarinata.
„	10	from bottom *after* Cyclotus *read* (Cyathopoma.)
„	2	from bottom *for* Eunea *read* Ennea.

The above are the most important errata, several minor faults of misplaced punctuation, &c. occur, but they are obvious.

W. T. Blanford.

MEMORANDUM, *showing the final result of Archdeacon Pratt's calculations regarding the effect of Local Attraction upon the operations of the Great Trigonometrical Survey of India.*

To the Secretary of the Asiatic Society of Bengal.

DEAR SIR,—Having now received from London some copies of the last of my communications to the Royal Society on the amount of local attraction in India and its effect on the operations of the Trigonometrical Survey, I beg to present to the Asiatic Society a complete set of my papers on this subject bound up in one volume, and to request you to give insertion in your Journal to the following Memorandum, which gives a brief history of the circumstances connected with this investigation and of its final results.

I am, yours faithfully,

Calcutta, April 30th, 1862. JOHN H. PRATT.

MEMORANDUM.

The influence of Mountain Attraction upon the position of the plumb-line and of the spirit-level in the operations of the Great Trigonometrical Survey of India was first pointed out to me by the Surveyor General in 1852, who on that occasion requested me to turn my attention to the subject. The result has been a series of papers which have been published in the Transactions of the Royal Society for 1854, 1855, 1858 and 1861. During the nine years over which the investigation has extended, new information has been obtained from time to time, and new suggestions have presented themselves to my mind. Some things which had been published in one paper have had to be modified in a subsequent one, and the object of this Memorandum is, now that the series is complete, to state what is the final result of the investigation.

2. I will give a brief historical sketch of the circumstances connected with the publication of the successive papers in the *Philosophical Transactions*.

The Surveyor General of India pointed out to me in 1852, that in the volume published by his predecessor Colonel Everest in 1847, giving an account of the measurement of the two northern portions of the Great Arc between Kaliana and Kalianpoor, and Kalianpoor and Damagida, lying in the longitude of Cape Comorin, the observed

or astronomical amplitudes* were, the one 5″.236 less and the other 3″.791 greater than the calculated or geodetic amplitudes, the curvature of the Indian Arc being taken the same as that of the mean figure of the earth. This discrepancy was supposed to arise from local attraction,† deranging the position of the vertical determined by the plumb-line. This was a highly probable conjecture: but it required demonstration. The problem, then, which I set myself to solve was, To calculate by some direct method the actual amount of the attraction of the Himalayan mass, and of the deflection caused by it in the plumb-line. The result is shown in the FIRST PAPER of the series, *Phil. Trans.* 1854, p. 85, art. 43, (see also *Phil. Trans.* for 1858, p. 769, art. 22 of the Second Paper). The result therein obtained is very much larger than was expected or was required to explain the differences in the astronomical and geodetic amplitudes which Colonel Everest had detected. This calculation seemed, therefore, to increase the difficulty which it was intended to remove; as, in the course of the investigation, this new fact came out, that the disturbing effect of the Himalayas is far greater in amount than any one had ever anticipated, and also of far more extensive influence, as its amount in the centre of India is found to be greater than it was supposed to be even at Kaliana only sixty miles from the hills.

To meet this new difficulty, Mr. Airy, the Astronomer Royal, suggested that there is probably a deficiency of matter immediately beneath the mountains, such as to counteract their effect upon stations in the plains. He assigns his reasons in a paper published in the same volume of the *Philosophical Transactions* and which I have introduced in this series for convenience of reference, (pp. 101—104) Objections to this hypothesis are given in the postscript to a paper I wrote on the English Arc in the volume for 1855, and which is also introduced on account of that postscript, (see p. 51).

* For the benefit of non-Scientific readers I will mention that the *amplitude* of an arc of meridian is the difference of latitude of its extremities.

† If the earth were a perfect spheroid and its materials as we descend downwards were arranged in concentric spheroids, such as the mass would assume if it were fluid, then the total attraction of the earth's mass at any point of its surface would be perpendicular to the surface and the plumb-line would hang in that perpendicular. But if there were any superficial masses, such as mountains, or hollows, such as oceans, or any defect or excess of density in any parts of the earth's crust, a corresponding change would take place in the total amount and direction of the attraction. The resultant effect of these new and disturbing causes at any place is called the LOCAL ATTRACTION at that place.

Four years after this, following up Mr. Airy's suggestion, I proposed and reduced to calculation another hypothesis regarding deficiency of matter below the mountains; viz. that the irregularities of the mountain surface have arisen from the expansion upwards of the crust of the earth from depths below, which has upheaved the mountains and produced a slight but extensive attenuation of the mass below them. The result of this calculation is given in the Second Paper of this series. I show that it is sufficient to produce a considerable amount of compensation for mountain attraction; but that it does not clear up the difficulties; and that as this attenuation is a mere hypothesis, nothing certain can be determined regarding it.

In this same paper it is shown that a very slight but wide-spread defect or excess of density in the materials of the crust of the earth is capable of producing a sensible and important effect on the plumb-line. Thus the possible and not improbable existence of an unknown cause of derangement of the plumb-line hitherto unthought of, as being hidden in the crust, was brought to light.

During the same year it occurred to me that there is another visible cause of disturbance besides the mountains which might produce a sensible effect, viz. the ocean, as its density is less than that of rock. In the Third Paper this effect is calculated, and found to be of importance: (see *Phil. Trans.* for 1858, p. 790, art. 11). Thus a new source of error was detected.

3. Thus far, then, the attempt to clear up the discrepancies detected in the first instance by Colonel Everest between the astronomical and geodetical amplitudes had led to the discovery, that (1) the Himalayas attract places in the plains of India with a force far greater in amount than any person had conceived: And not only so, but that (2) the ocean also has an important influence of the same kind: And more than this, that (3) variations of density in the crust, which are as likely to exist as not, will produce the same effect.

The uncertainty, as to the form of the Himalayas and the depth of the ocean, produces a corresponding degree of uncertainty as to the exact amount of the attraction; while our utter ignorance regarding the condition of the crust below seemed to leave us in hopeless perplexity regarding the derangement which may proceed from that quarter. So that the attempt to determine the resultant amount of local attraction at stations on the Indian Arc by direct calculation would appear, for these reasons, altogether fruitless.

As noticed in these papers, I conceived also that the difference between the geodetic and astronomical amplitudes might arise, not solely from attraction influencing the plumb-line, but in part from the curvature of the Indian Arc being somewhat different from the curvature of the mean figure of the earth. Geology teaches us, that the earth's surface has undergone changes of level. The surface, therefore, cannot be now an exact spheroid. In this case the normals at the extremities of the actual arc would include an angle not precisely equal to the amplitude of the mean or undisturbed arc, and part of the errors to be accounted for might, it was thought, arise from this; the remainder arising from local attraction influencing the plumb-line, and therefore affecting the observed or astronomical amplitude. This served to introduce a new element of difficulty.

4. The ambiguity, however, with which the question was thus beset from all these causes is removed in the Fourth Paper, the last of the series, published in the *Philosophical Transactions* of 1861. The following theorem is there demonstrated:—That the length of the actual arc, altered as its form and position may be by geological changes, is nevertheless sensibly equal to the length of the mean or undisturbed arc. Hence, if we calculate the amplitude by using the measured length of the arc, and the *mean* axes, as is done in the Survey, it will come out the mean or undisturbed amplitude. The consequence of this is, that the relative position of places laid down on a map from geodetic operations is correct, and free from all sensible error arising from local attraction, from whatever causes local attraction may arise.

This is a most important practical result, and frees the Survey operations from a doubt which has attached to their high scientific accuracy, ever since it has been discovered that the influence of the Himalayas and of the ocean is so considerable, and that variations in the earth's crust below may have an important disturbing effect. This theorem, moreover, gives us a direct means of estimating at once the difference of local attractions, and of local deflections caused by them, at the extremities of an arc. For the difference is precisely equal to the quantity by which the astronomical amplitude differs from the mean or undisturbed amplitude found as above described.

5. There is only one desideratum remaining; but one which I

fear will never be met; that is, To devise a method for determining the absolute latitude of some one place included in the map. The state of the question is, as I have said, at present *this:* the position of places determined by geodetic operations is correct and free from the effect of local attraction, *relatively* to the station from which the operations start. But how to find the latitude of this starting point, freed from the errors produced by local attraction, is a problem unsolved, and unlikely to be solved. Even if any spot exists which is altogether free from local attraction, that is where all such influences nullify each other, it is impossible to discover it and to assure ourselves of the fact.

6. Thus geodesy can give us accurate maps of the relative position of places; but cannot, with the same accuracy, assign the position of the maps on the terrestrial spheroid. Suppose, to take a comprehensive case, that the whole globe were surveyed and all places in it connected by triangulation with the spot in the north where the plumb-line points to the north-pole in the heavens. The positions of all places would be found free from error relatively to this spot—which is commonly called the North Pole of the earth. But how can we be sure that the plumb-line at that spot is hanging in the true vertical? It may be under the influence of local attraction: in which case, although it points to the pole in the heavens, the spot in question will not be the pole on the earth. There is no means, nor can I conceive any means possible, short of ascertaining all the disturbing causes throughout the earth's mass and calculating their effects, of determining whether the plumb-line *is* or *is not* at the true pole. The accurate position, therefore, of our maps on the terrestrial spheroid which depends upon this question is alike unknown and uncertain. This is the point to which the investigation is brought, and where, I have no doubt, it will stop. It is satisfactory that the mapping of a country may be laid down, free from all error as to the relative situation of places: also that the relative amount of local attraction, comparing one place with another, can be determined, because this may assist in ascertaining the structure of the crust below. It would, however, be still more satisfactory if this one remaining difficulty could be removed, as it would make the data more complete for the high scientific determination of the Figure of the Earth.

A Memoir on the living Asiatic species of Rhinoceros.—By Edward Blyth.

Among the investigations to which I devoted particular attention during my late rambles in Burmá, was the endeavour to corroborate and *confirm* the statement of Helfer and others, that the three known Asiatic species of Rhinoceros inhabited that region. In this I succeeded, so far as the two insular species (*viz.* the one-horned Rh. sondaicus and the two-horned Rh. sumatranus) are concerned; for these prove to be the ordinary Rhinoceroses of the Indo-Chinese region and continuous Malayan peninsula; and I have reason now to believe that they are the only Rhinoceroses of that great range of territory; the huge Rh. indicus (so far as I can discover) appearing to be peculiar to the *tarai* region at the foot of the Himálayas and valley of the Bráhmaputra (or province of Asám); the Rhinoceros still common in the eastern Sundarbáns, and also of the Rájmáhal hills in Bengal (where fast verging on extirpation), being identical with that of Jáva and Borneo, in the great oriental archipelago; while the Asiatic two-horned species (Rh. sumatranus) appears to be more common than the lesser one-horned (Rh. sondaicus) in the Indo-Chinese territories,—this animal extending northward to the Ya-ma-doung range of mountains which separates Arakan from Pegu, where Col. Yule observed it as high as the latitude of Ramri island, and I have been assured by Major Ripley that one was killed not long ago in the vicinity of Sandoway. What the particular species may have been that was hunted by the Mogul Emperor Báber on the banks of the Indus cannot now be ascertained; unless, indeed, some bones of it may yet be recovered from the alluvium of that river. It is remarkable that he compares its bowels to those of a Horse! A species is also stated by Duhalde to inhabit the province of Quang-si in China, in lat. 15°. This is much more likely to prove either Rh. sondaicus or Rh. sumatranus, than the large Rh. indicus.

It is true that the late Dr. Theodore Cantor, in his 'Catalogue of the mammalia of the Malayan peninsula' (*J. A. S.* XV, 263), asserts that both Rh. indicus and Rh. sondaicus "seem to be numerous" there; but he does not mention that he had examined specimens;

and he moreover notices that "a two-horned Rhinoceros is stated by the Malays to inhabit, but rarely to leave, the densest jungle." As this animal is common in parts of Burmá, as well as in Sumátra, it may be confidently predicated to inhabit the intervening region of the Malayan peninsula: but the more common and ordinary species of the peninsula would appear to be Rh. SONDAICUS; and a friend who has killed as many as nine individuals in the southern half of that region, to whom I shewed several skulls of INDICUS and of SONDAICUS, is positive that all which he saw there were of the lesser one-horned species, as distinguished from the larger. The former, as before remarked, inhabits the islands of Jáva and Borneo in the archipelago, but not Sumátra;* whereas the two-horned species, as an insular animal, appears to be peculiar to Sumátra.† In the volume on Elephants, &c. in Sir W. Jardine's 'Naturalist's Library,' the lesser one-horned Rhinoceros is erroneously styled "the one-horned Sumátran Rhinoceros;" a mistake which might have been rectified by reference to Sir T. St. Raffles's paper in the 13th Vol. of the 'Transactions of the Linnæan Society,' which indeed is cited by the compiler.‡

The vernacular topical names of *Jávan* and *Sumátran* Rhinoceroses had now better be disused; seeing that both species have an extensive range of distribution on the mainland of S. E. Asia; the latter should rather be denominated 'the Asiatic two-horned Rhinoceros;' and the two others 'the Great one-horned' and the 'Lesser one-horned;' unless, indeed, the alleged discovery should be confirmed of the existence of a one-horned species in inter-tropical Africa, in addition to the four two-horned species which are now recognised

* The range of Bos SONDAICUS is similar; excepting that this animal does not extend to Bengal, like RHINOCEROS SONDAICUS.

† As also the Malayan Tapir, the continental range of which extends northward to the Tenasserim provinces of Tavoy and Mergui.

‡ The adult male Rhinoceros which lived for many years in the gardens of the Zoological Society, Regent's Park, London, (and for which the considerable sum of £1000 was paid,) is stated to have been captured in Arakan; but he was not nearly so large as several that I have since seen in India; and, therefore, I entertain an exceedingly strong suspicion that he was no other than SONDAICUS. His bones have doubtless been preserved. The two Asiatic one-horned species, indeed, resemble each other a great deal more nearly, in external appearance, than the published figures of them would lead to suppose. Certainly no sportsman or ordinary observer would distinguish them apart, unless his attention had been specially called to the subject. The best figure I know of adult Rh. INDICUS is that published by Cuvier and Geoffroy, in the *Menagérie du Museum d'Hist. Nat.*

upon that continent (in which case the 'Great Indian' and the 'Lesser Indian' might be deemed sufficiently appropriate; as the range of the 'Asiatic two-horned' does not extend to India proper, which of course comprises Bengal but not Burmá). The existence of an African one-horned Rhinoceros was long ago affirmed by James Bruce of Kinnaird, in addition to the two-horned species which he pretended to figure;* and Sir Andrew Smith assured me that he had been repeatedly told by natives that such an animal occurred in the regions northward of the tropic of Capricorn. In the *Comptes Rendus*, tom. XXVI (1848), p. 281, an elaborate letter is published 'Sur l'existence d'une espèce Unicorne de Rhinocéros dans la partie tropicale de l'Afrique,' from Mons. F. Fresnel, then Consul of France at Jidda ('Djedda'), to which the reader, curious on the subject, is referred.

* Bruce's figure of the Abyssinian Rhinoceros, it is well known, is a reversed copy of Buffon's representation of true Rh. INDICUS, with a second horn added.—Dr. Rüppell ascertained the species to be Rh. AFRICANUS, the ordinary 'Black Rhinoceros' of S. Africa. The earliest-published *genuine* figure of this animal is that in the Supplement to Buffon's work; but certainly the most spirited as well as correct pictorial representations, alike of the Rhinoceroses and of various other animals of Africa, are given by modern sporting travellers, as Cornwallis Harris, and especially C. J. Andersson. By a slip of the pen, the latter writer alludes to Rhinoceroses in the island of Ceylon! As even Humboldt referred to the Tiger of Ceylon in his *Asie Centrale!*

There are capital figures of some of the arctic animals, also, in Mr. J. Lamont's 'Seasons with the Sea Horses' (1861); among the rest, of the Spitzbergen Deer, represented with well-developed vertical brow-plates to their horns (*vide J. A. S.* XXIX, 376). The question about the development of these Deer, as compared with those of Lapland, (mooted *loc. cit.*, p. 382,) is elucidated by Mr. Lamont, who states that—"They do not grow to such a large size as the tame Rein Deer of Lapland, nor are their horns quite so fine; but, they attain to a most extraordinary degree of condition. For further details, *vide* his extremely interesting volume. However, I may remark that in all his figures of Rein Deer the brow-plate is represented as being well-developed upon each horn; whereas I suspect that it is, generally, only rudimentary upon one of the pair; this, however, is probably a mistake on the part of the lithographer!

In further reference to the article alluded to, in which I commented upon the late Professor Isidore St. Hilaire's remarks upon domestic animals, and contended that we do not owe the domestication of the Turkey to the Spanish invaders of America, (a most unlikely people to have accomplished anything of the kind,) I may remark, that so completely familiar had this fowl become in Shakespere's time, that its then almost recent introduction into Europe had already been forgotten; for the great bard of Avon considerably ante-dates the existence of Turkeys in England, making it prior to the Spanish discovery of the New World! In the first part of the drama of King Henry IV, Act II, Sc. 1, one of the carriers introduced exclaims—"'Odsbody! The turkeys in my panniers are quite starved." But it is not impossible that Shakespere meant the Guinea-fowl; albeit not very probable: though, in either case, he had ante-dated the appearance of the domestic bird in European countries.

Professor Schinz, in his *Synopsis Mammalium* (1845), makes out as many as eight living species of Rhinoceros. The two Asiatic one-horned species, of course; and SONDAICUS only from Jáva: SUMATRANUS from Sumátra only; and of this he remarks—"Cornu anterius mediocre, posterius minutum" (not having seen Bell's outline of the horns of the male, in the *Phil. Trans.* for 1793, to be noticed presently). His *Rh. niger* and his *Rh. Camperi* must alike be referred to RH. AFRICANUS (seu *capensis*). Next, RH. SIMUS and RH. KEITLOA; but, of course, neither RH. OSWELLII nor RH. CROSSII. But what is his *Rh. cucullatus*, Wagler (Schreber's *Supp.*, *tab.* CCCXVII,—F. Schinz, *Monagr.*, *t.* 4)? Unless an ill-stuffed RH. SUMATRANUS! "Rh. cornubus duobus, capite sensim elevato, plicis cutis profundis [!], clypeo scapulari indiviso, supra latiori, epidermide verrucis parvis obsita. Capite elongato, auriculis subcylindricis, labro elongato prehensili, cauda mediocri. Long. corporis 6, 11″, caudæ 1′ 7″. Altitudo stethiaci 3′ 4½″, uraci 3′ 4½″. Habitat —— ? Hospitatur in museo Monacensi."

From examination of an extensive series of skulls of Asiatic Rhinoceroses, it is impossible not to discern that there are three well marked species, each of which varies considerably in the shape of the cranium. Of each there is a shorter and broader type, higher at the occiput, wider anterior to the orbits; and also a type the opposite of this, with every intermediate gradation. This amount of variation in the existing Asiatic species of the genus should intimate caution in the acceptance of *all* of the very numerous fossil forms that have been named by palæontologists.

The RH. SONDAICUS and RH. SUMATRANUS are very inadequately represented by the figures of skulls published by Cuvier and de Blainville. Those of both authors represent the narrow type, as distinguished from the broad type; whereas their figures of the skull of RH. INDICUS (seu *unicornis*, L.,) represent an unusually fine broad example of the species (doubtless the skull of the individual figured from life in the *Menagérie du Muscum d'Hist. Nat.)*; which gives a far greater amount of contrast of appearance to the skulls of INDICUS and SONDAICUS, than exists in average specimens of those of the two species.

The skulls of INDICUS and SONDAICUS appear to differ only, *constantly*, in the former being considerably larger, and having the con-

dyle of the lower jaw (proportionally) much more elevated; imparting a conspicuously greater altitude to the vertex when the lower jaw is *in sitû*. Both species would appear to exhibit precisely the same amount of variation. On present evidence (which, however, I suspect to be fallacious), it would seem that the broader type of SONDAICUS prevails in Bengal, and perhaps the narrower far southward; but we have both from the Tenasserim provinces; and they completely grade into each other, as equally in the analogous instances of INDICUS and SUMATRANUS.

In illustration of the skulls, I cite the figures of Cuvier and de Blainville (*Oss. Foss.*, *Atlas*, pl. 42, f. 1, pl. 160, f. 1,—*Osteographie*, *Rhinoceros*, pl. 2), as exemplifying the broad-faced type of RH. INDICUS; and a very similar skull is that upon the skeleton of a *female* in the museum of the Calcutta Medical College. This female is one of a pair that lived about 45 years in captivity in Barrackpore park. I have repeatedly seen the pair when alive, many years ago; and remarked that they shewed no *secondary* sexual diversity, being exactly of the same size and general appearance. They never bred; and I have been informed that a pair of Tapirs similarly kept, for many years,in Batavia,shewed no disposition to propagate their species. They should, of course, have been separated for a time now and then, and again put together. We learn, from this Calcutta Medical College specimen and others, that the two forms of skull presented by the Asiatic species of Rhinoceros are not indicative of sex, as might probably have been suspected.

I now figure (pl. I, fig. 1, and pl. II, fig. 1,) a very fine example of the narrow type of skull of RHINOCEROS INDICUS; a splendid adult male, with its horn. Let this be compared and contrasted with the figures of the broad-faced type of skull published by Cuvier and de Blainville. The skull now represented belongs to Capt. Fortescue, of the late 73rd Regiment of Bengal Native Infantry; who killed the animal on the Butan side of the river Tista, not far from Jálpigári. He has taken it to England. Two specimens in the Calcutta Medical College museum are very similar; a third is intermediate, though decidedly rather broad than otherwise; and a fourth (that already noticed, with complete skeleton, *female*, as before specified,) very closely approximates—even to minute details—the superb broad skull figured by the eminent French zoologists. Five examples, in all, under

examination, besides the figures referred to. Strange to say, we do not yet possess a single 'spoil' of this species in the museum of the Society! But I trust and have reason to believe that this singular *hiatus* in our series will speedily become a record of the past.

Plate I, fig. 2, represents the broad type of skull of Rh. SONDAICUS, from the Bengal Sundarbáns; and pl. II, f. 2, the same from the Tenasserim provinces. Pl. I, f. 3, and pl. II, f. 3, represent an aged specimen of the narrow type of SONDAICUS, *from Jáva.* We have Tenasserim examples quite similar, except that they are not so aged; but I figure the Jávanese one, that there should be no misapprehension about the identification of the species. I have already remarked that these comparatively broad and narrow types completely grade into each other, as likewise in the preceding species. It is simply impossible to trace a dividing line in the instance of either one of the three.

Plate III, fs. 1, 2, represent the corresponding types of males of the two-horned Rh. SUMATRANUS; f. 3, of a female, of which the stuffed skin of the head is also in the Society's museum. All are from the Tenasserim provinces.

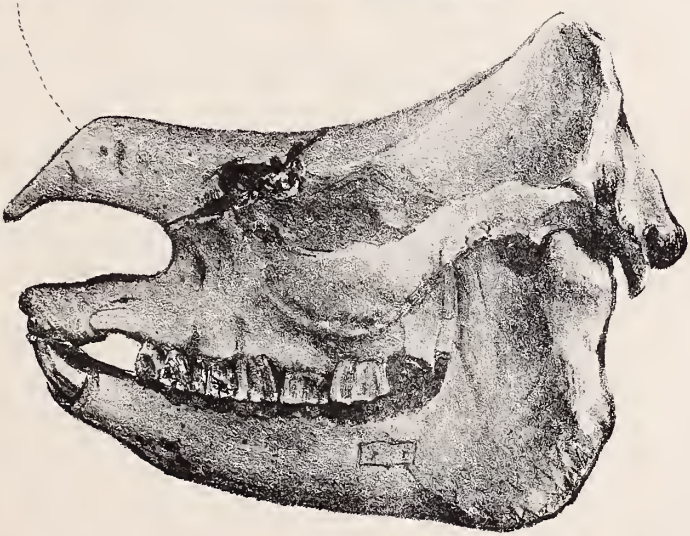
Plate IV, f. 1, is from a drawing which I took of a beautiful specimen in the possession of Lt.-Col. Fytche, Commissioner of the Martaban and Tenasserim provinces, at Moulmein.* The animal was killed in Tavoy province, near the frontier of Siam. When I first saw this specimen, the horns were attached to the skin; and they now *fit* to the rugosities of the bony surface. The resemblance of the anterior horn (more especially) to the extraordinarily fine horn figured as that of a new species, Rh. CROSSII, Gray (in the *Proc. Zool. Soc.* 1845, p. 250, and copied in pl. IV, f. 4), induced me to conjecture that the latter was merely a magnificently developed specimen of the anterior horn of Rh. SUMATRANUS; but the difference of size (that of Rh. CROSSII measuring 2 ft. in span of curvature from base to tip) seems to be too great. Of the near affinity, however, there can be no doubt; and it is just such a horn as the nearly akin (however huge) Rh. PLATYRHINUS of Cautley and Falconer, from the Siwâlik deposits, might have borne.† Other kindred fossil species

* The horns, as represented in the lithograph, are not sufficiently massive.

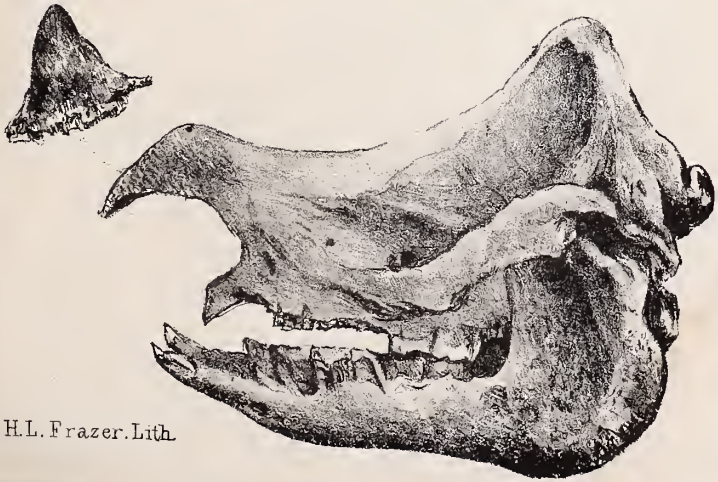
† In a letter just received from Col. Fytche, who had recently returned from a tour in the southern Tenasserim provinces, that officer writes—"I came across

Pl. I.

f. 2.



f. 1.

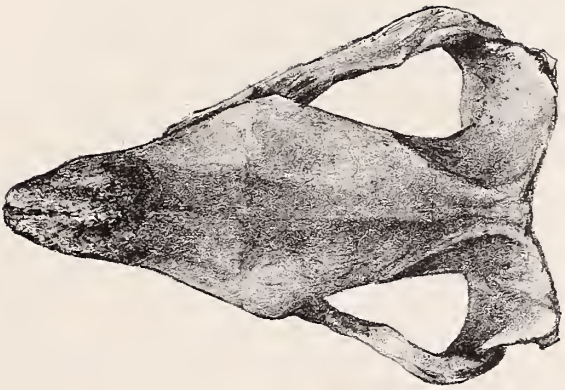


f. 3.

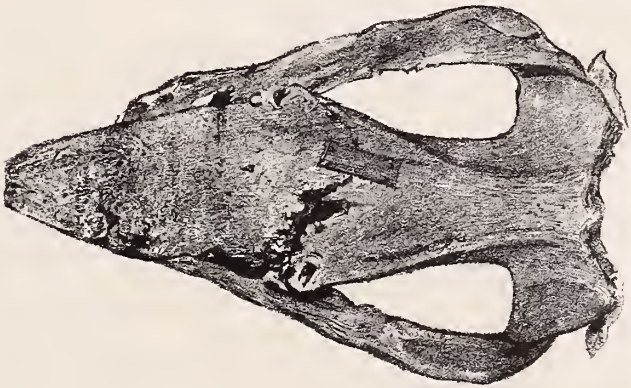
H.L. Frazer. Lith.

Calcutta

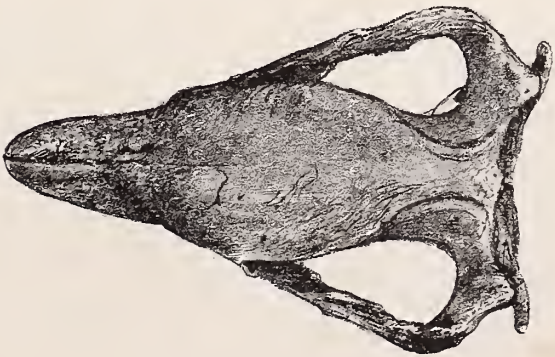
Pl. II.



f. 2.



f. 1.



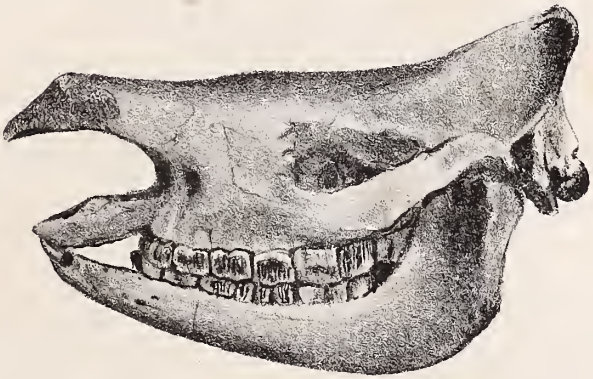
f. 3.

H. L. Frazer Lith.

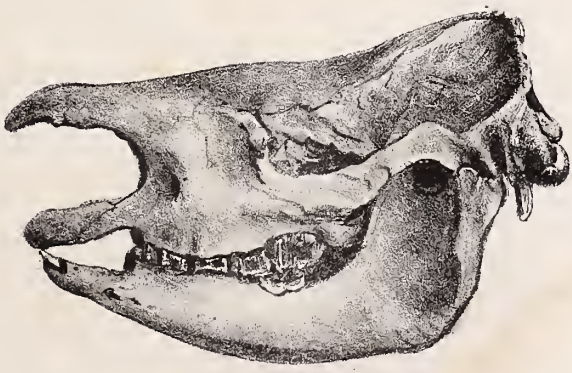
Calcutta.

Pl. III.

f. 1



f. 2



f. 3

H.L Frazer Lith.

Calcutt

Pl. IV

f. 4.

f. 1.

f. 3.

f. 2

H. L. Frazer Lith.

Cal

are (or were) the Rh. LEPTORHINUS of the later European tertiaries, apparently also the Rh. SCHLEIERMACHERI (v. *megarhinus*), and I cannot help thinking even the immense Rh. TICHORHINUS,—all of these exemplifying an Eurasian or Europæo-asiatic (and more or less hair-clad) type of two-horned Rhinoceros, as distinguished from the existing two-horned African type, which is represented by as many as four living species (falling under two groups, with prehensile and non-prehensile upper lip, and browsing or grazing habits accordingly,—those of the latter habit being more gregarious and also more gentle in disposition*). Figs. 3 and 4 of plate IV, represent the front view of the skulls fs. 2 and 3 of pl. III; but I have reason to suspect that the united nasal bones of f. 4 of plate IV, are rarely so narrow in the female of Rh. SUMATRANUS, as in the example represented.

With the exceptions of fs. 1 and 4 of pl. IV, all the representations given were photographed together in one focus, so that the relative sizes are quite accurately rendered. The scale of all is $1\frac{1}{2}$ in. to 1 ft.†

So far as I can learn, the Rh. SUMATRANUS is the only existing species of Rhinoceros which presents secondary sexual distinctions; inasmuch as the horns of the male are very considerably more deve-

three Rhinoceroses down to the southward, but was unsuccessful. One, the monarch of the forest, I tracked up a mountain some 4,000 ft. high, which took me six hours to get up; and close on the top, he rose up before me within six feet, a magnificent beast. He was sideways towards me, and I distinctly saw his two horns, which were at least ten to twelve inches longer than those I have got. He would have been a great prize; but, unfortunately, I had not my rifle in my hand at the time, and the man who was carrying it fell down on his face in a fright, and rolled down the hill. The beast was certainly a rather startling apparition; his advent being so very sudden, as if he had come up through a trap-door in a pantomime, giving a tremendous roar, something between that of an Elephant and that of a wild Boar."

* For figures of the heads of these animals, in a collated group, *vide* Mr. C. J. Andersson's 'Lake Ngami,' 2nd edit., p. 986. The affinity of the extinct European species with Rh. SUMATRANUS has been long ago remarked by Cuvier and Owen. The Siwálik Rh. PLATYRHINUS of Cautley and Falconer is just Rh. SUMATRANUS enormously magnified; and the Rh. SIVALENSIS of the same naturalists comes exceedingly close to the existing INDICUS (with the narrow form of skull, and their Rh. PALÆINDICUS to the same with broad form of skull). Can it be the identical species which has lived down to the present time? The discrepancy is, at least, not greater than subsists between BISON PRISCUS and the modern *Zubr*, which are considered by Owen to be one and the same.

Since writing the above, I have read Prof. Owen's memoir 'On a National Museum of Natural History.' Even he, evidently, had no idea of the two insular species of Rhinoceros extending their range to the mainland, as appears from his casual notice of them.

† For these and other photographs of objects of Natural History, I have to thank my esteemed friend T. S. Isaac, Esq., C. E.

loped than those of the female. It further differs from the four existing African species of two-horned Rhinoecros, not only by possessing slight skin-folds, but also by having the bases of the horns separated by a considerable interval: Bell's figure (in the 'Philosophical Transactions' for 1793) represents, as I believe, their full development in an adult female; as shewn likewise in a (Tenasserim) stuffed head in the Society's museum, already referred to: and over Bell's figure of the skull of a male are represented in outline the horns of an ordinary male; not quite so fine, however, as those upon Col. Fytche's specimen; and that officer informs me that he has possessed a head with still finer horns, some five or six inches longer. Unfortunately, fine horns of Rh. sumatranus are exceedingly difficult to procure; as they are eagerly bought up at high prices by the China-men, who not only value them as medicines, but carve them into very elegant ornaments.* Still the horns which Dr. Salomon Müller figures, upon what he calls an adult male, are small; and when I was at Pahpoon, amid the forests of the Yunzalin district of Upper Martaban, in November last, an animal of this species was killed within five miles of me; but I did not learn of this in time, and was only able to procure the facial bones with the two horns. From their size and appearance I took them to be the horns of rather a juvenile male; but, on cleaning the bone, the nasals were found to be most completely and solidly anchylosed and united, and of the usual width in the male sex. The Karens obtained the animal by means of a heavy falling-stake, such as they set for Tigers and other large game;† and the carcase was completely hacked to pieces by them, and every edible portion of it devoured.

The Rev. Dr. Mason remarks, in his work on 'The Natural Productions of Burmah' (1850), that the hide of the two-horned Rhinoecros of that region is "smooth like a Buffalo's." This expression might mislead into the suspicion that the species is not exactly the same as that of Sumátra. Col. Fytche writes word, on this subject,

* The anterior horn of Col. Fytche's specimen is worth (I was told) about fifty rupees, or £5.

I have seen a pair beautifully carved and polished, and set with the bases upward, in a black wooden frame similar to the stands on which Chinese metallic mirrors are mounted; and am sure *now* that they were the two horns of one individual of Rh. sumatranus, of about the same development as those upon Col. Fytche's specimen.

† *Vide* Andersson's 'Lake Ngami,' 2nd edit., p. 258.

—"I have, myself, shot three Rhinoceroses; one single-horned, on the borders of Asám [INDICUS, of course]; and the other two, not far from Bassein in the Yomatoung range separating Pegu from Arakan. I saw the skin of the one whose skull you have got [that of RH. SONDAICUS (of the narrow type), shot by my friend Dr. Hook of Tavoy near Tavoy Point, where there is a small isolated colony of the species], and it was exactly, in every respect, like the one I shot in Asám. The two-horned fellows I shot had smooth skins, as stated by Mason; they were, however, very thick, and there were slight rumples or folds about the neck and shoulders, I remember, but nothing to be compared in size to the mailed armour of the single-horned species." In Burmá, people distinguish only a one-horned kind and a two-horned kind; and though the skull from Tavoy Point, referred to, is very nearly adult and of fair size, Col. Fytche thought it to be that of a small and immature animal, as compared with the huge INDICUS that he killed in Asám. I must frankly confess that I have only quite recently discriminated the two one-horned species; fancying, as a matter of course, that the numerous skulls of single-horned Rhinoceroses in the Society's museum, from the Bengal Sundarbáns, &c., especially of the broad-faced type, were necessarily of the hitherto reputed sole Indian species. F. Cuvier's figure of RH. SONDAICUS is that of a very young animal; and, with those of Horsfield and S. Müller, conveys the appearance of a more evenly *tessellated* hide than I remember to have seen in any living continental example. I have, however, been comparing our stuffed Sundarbán example (less than half-grown) with the figure of adult RH. INDICUS in the *Menagérie du Museum d'Hist. Nat.*, and with the figures of RH. SONDAICUS by S. Müller and others; and perceive that it must be referred to the latter and not to the former. The tubercles of the hide *are* much smaller than in INDICUS; and a marked difference between the two species, as represented, consists in the great skin-fold *at the setting on of the head* of INDICUS, which is at most but indicated in SONDAICUS. In skulls of adults, however those of both species may vary in width, and especially in breadth anterior to the orbits, the following distinctions are *trenchant*. Length of skull, from middle of occiput to tip of united nasals (measured by callipers),—in INDICUS 2 ft. ($\frac{1}{2}$ in. more or less),—in SONDAICUS, $1\frac{3}{4}$ ft. at most. Height of condyle of lower jaw,—in

INDICUS 1 ft. (or even a trifle more),—in SONDAICUS 9 in. Breadth of bony interspace between the tusks of the lower jaw,—in INDICUS $1\frac{1}{2}$ to $1\frac{3}{4}$ in.,—in SONDAICUS $\frac{3}{4}$ to 1 in. These measurements are taken from exceedingly fine examples of both species.

Sir T. Stamford Raffles asserts, of RH. SUMATRANUS, that "the female has a larger and heavier head than the male, but is similar in other respects." (!) This decidedly does not apply to the two-horned species inhabiting Burmá; nor even to Bell's figures of *Sumatran* individuals! Raffles further remarks that—"Dr. Bell's description and representation of this animal are extremely correct. The skin of the Sumatran Rhinoceros," he adds, "is much softer and more flexible than that of the Indian one, and is not, like it, corrugated into plates of mail. It has, however, some doublings or folds, particularly about the neck, shoulders, and haunches, rather more distinct and defined than in Dr. Bell's drawing. The natives assert that a third horn is sometimes met with; and in one of the young specimens procured, an indication of the kind was observed." (*Lin. Tr.* XIII, 268.) In Mr. C. J. Andersson's 'Lake Ngami' (2nd edit., p. 263), the same is remarked of one or more of the ordinarily two-horned Rhinoceroses of Africa. This traveller writes—"I have met persons who told me that they had killed Rhinoceroses with three horns; but in all such cases (and they have been but few) the third or hindmost horn is so small as to be scarcely perceptible." This seems a not unlikely character to have been developed more frequently in the great fossil RH. TICHORHINUS of N. Europe and Asia.

Bell further mentions, of RH. SUMATRANUS, that—"The whole skin of the animal is rough, and covered very thinly with short black hair." The latter is conspicuously represented in F. Cuvier's portrait of the species in the *Planches des Mammifères*, less so in Bell's figure in the *Phil. Trans.*, and in that by Dr. Salomon Müller; and it is well shewn about the *jowl* and base of the lower jaw of our stuffed skin of the head of an adult female. In Dr. S. Müller's figure of what he styles an adult male (but the horns of which are quite small, as in the adult Martaban example before noticed*), the shoulder-plait is rather more strongly developed, especially towards

* Can these animals, under any circumstances, occasionally shed and renew their horns, which consist only of a mass of agglutinated hair? There is certainly no physiological objection to the possibility of their doing so.

the elbow, than in the figures published by Bell and F. Cuvier,—F. Cuvier's figure representing a young male, and that by Bell a mature female, while the skull represented by Bell is that of a male with finer horns than appear to have been hitherto represented elsewhere. The figure in the 'Naturalist's Library' (*Elephants*, &c., pl. XI,) is an exaggerated and very incorrect copy of that by F. Cuvier, with the skin-folds greatly too much developed.

Sir T. St. Raffles further remarks, of the Asiatic two-horned Rhinoceros (in Sumátra), that—"They are not bold, and one of the largest size has been seen to run away from a single Wild Dog." We hear, however, of a "fire-eating Rhinoceros" in Burmá, from its habit of attacking the night-fires of travellers, and scattering the burning embers and doing other mischief, being attracted by unusual noises instead of fleeing from them as most wild animals do. Prof. Oldham's camp was attacked in this way, in Tavoy province; and the animal being mortally wounded by a 2 oz.-ball, its skull was recovered three days afterwards, and proved to be that of SUMATRANUS. The same propensity is ascribed to the ordinary black Rhinoceros of S. Africa (RH. AFRICANUS). Thus Dr. Mason cites—"This animal appears to be excited by the glow of a fire, towards which it rushes with fury, overcoming every obstacle. It has been known to rush with such rapidity upon a military party lodged among the bush covering the banks of the Great Fish river, that, before the men could be aroused, it had severely injured two of them, tossed about and broken several guns, and completely scattered the burning wood." I am not aware that the same ferocity has been remarked of either of the mailed one-horned species.

In Java, the RH. SONDAICUS is reputed to be rather a mild animal; though I could cite a rumour of one attacking a sailor's watering party. (*Zoologist*, p. 7328.) According to Professor Reinhardt, this animal is (in Jáva) "found everywhere in the most elevated regions, and ascending, with an astonishing swiftness, even to the highest tops of the mountains." (*Edinb. Phil. Mag.* XIII, 34.) Dr. Horsfield also notices that "it prefers high situations, but is not limited to a particular region or climate, its range extending from the level of the ocean to the summits of mountains of considerable elevation.*** Its retreats are discovered by deeply excavated passages, which it forms along the declivities of mountains and hills.

I found these occasionally of great depth and extent." In Bengal, I believe that the identical species is found in the Sundarbáns, and also (formerly, at least,) in the Rajmáhal hills at all elevations; but it has hitherto been universally mistaken for Rh. INDICUS, a species which may inhabit the same localities,—only that now remains to be ascertained, as also if Rh. SONDAICUS extends its range to the region tenanted by the other. All evidence at present attainable points to the opposite conclusion.

So long ago as in 1838, the late Dr. Helfer remarked that—"The Tenasserim provinces seem to be a convenient place for this genus; for I dare to pronounce almost positively," he then wrote, "that the three known Asiatic species occur within their range. The Rh. INDICUS being found in the northern part of these provinces, in that high range bordering on Zimmay called the Elephant-tail mountain; the Rh. SONDAICUS, on the contrary, occupies the southernmost parts; while the two-horned Rh. SUMATRANUS is to be found throughout the extent of the territories from the 17° to the 10° of latitude. In character the Rh. SONDAICUS seems to be the mildest, and can be easily domesticated; the powerful Indian Rhinoceros is the shyest; and the double-horned is the wildest." (*J. A. S.* VII, 861.) Mason (in 1850) remarked that "the common single-horned Rhinoceros [SONDAICUS] is very abundant. The double-horned is not uncommon in the southern provinces:" and then he alludes to the alleged 'fire-eater' of the Burmans, supposing that to be SONDAICUS, as distingished from "the common single-horned" kind, which he thought was INDICUS. Very decidedly, I consider that the alleged existence of the great sub-Himálayan INDICUS in Bengal, the Indo-Chinese region, and Malayan peninsula, remains to be proved; the broad and narrow types of skull of SONDAICUS having, I suspect, been mistaken for INDICUS and SONDAICUS respectively. That the real species denoted by these names was so early discriminated, I opine is mainly due to the accident of SONDAICUS having been first obtained in Jáva, which induced the suspicion of its being probably different from the only then recognised continental species, inhabiting Upper India; likewise to the accident of the Paris museum containing a particularly fine skull of the true INDICUS, which (as before remarked) is probably that of the individual figured in the *Menagérie du Museum d'Hist. Nat.*

The museum of the Calcutta Medical College contains, as we have seen, three noble skulls of INDICUS, besides that with the entire skeleton of an old female (both the broad and narrow types of skull being represented) ; but it has neither SONDAICUS nor SUMATRANUS. The Society's museum still wants the first species ; but is tolerably well supplied with the two others. Sir T. H. Maddock, in 1842 (*J. A. S.* XI, 448), presented us with two skulls of SONDAICUS (of the broad and the narrow types), and also with two of SUMATRANUS (one wanting the lower jaw),—all from the Tenasserim provinces : and the skulls of an old male and of an adult female of SUMATRANUS, the skin of the head of the latter, its *axis* vertebra, the long bones of the limbs *(minus* the right fore-limb and *scapula)*, and the two scapulæ and long bones of the four limbs of the male, were presented to the Society by E. O'Reilly, Esq. (then of Amherst) in 1847 (*J. A. S.* XVI, 310, 502). In the *As. Res.* Vol. XIII, *App.* XVIII, " part of the head of a two-horned Rhinoceros" is recorded to have been presented ; and again, p. XIX, " the horn of a Rhinoceros from Sumátra." The latter was not in the museum when I took charge of it in 1841 ; but the former I think that I recognise in a pair of united nasal bones (certainly belonging to this species), and in this case the specimen would probably be from a Sumátran individual.* Of SONDAICUS we have also a fine series of skulls (one of them from Jáva, presented by the Batavian Society in 1844), the almost complete skeleton of a very nearly full-grown female (being considerably smaller than that of the female INDICUS in the Medical College museum), and the small stuffed specimen to which I have before referred : the limb-bones of the skeleton being considerably more robust than those of SUMATRANUS. For this skeleton, (and those of Elephant and Camel,) we are indebted to a former Náwâb Názim of Bengal ; and it is, doubtless, either from Rajmáhal or the Sundarbáns : the skull being of the broad type, though less strongly marked than some others, in fact intermediate, though scarcely quite mid-way intermediate.

The following notice by Sir T. Stamford Raffles may be advantageously reproduced here.

" The one-horned Rhinoceros of India is not known to the natives of this part of Sumátra ; and the single horns, which are occasionally

* Add also the facial bones with small horns which I brought from Martaban.

procured, appear to be merely the longer horns of the two-horned species separated from the smaller one. There is, however, another animal in the forests of Sumatra never yet noticed, which, in size and character, nearly resembles the Rhinoceros, and which is said to bear a single horn. This animal is distinguished by having a narrow whitish belt encircling the body, and is known to the natives of the interior by the name of *Tennu*. It has been seen at several places; and the descriptions given of it by people, quite unconnected with each other, coincide so nearly, that no doubt can be entertained of the existence of such an animal. It is said to resemble in some particulars the Buffalo, and in others the *Badak* or Rhinoceros. A specimen has not yet been procured; but I have several persons on the look out, and have little doubt of soon being able to forward a more accurate description from actual examination.

"It should be remarked," continues Raffles, "that the native name, *Tennu*, has, until lately, been understood to belong to the Tapir. It is so applied at Malacca, and by some of the people at Bencoolen. In the interior, however, where the animals are best known, the white-banded Rhinoceros is called *Tennu*, and the Tapir *Gindol*, and by some *Babi Alu*. It is not impossible, that, as both animals have white bands, the names may have been confounded by people little in the habit of seeing either, and deriving their information solely from report. In a country like Sumátra, where the inhabitants, in a great measure shut out from general communication, are divided into an infinity of tribes, speaking different dialects, a perfect consistency or uniformity of nomenclature cannot be expected, and it is not always easy to reconcile the synonymy." (*Lin. Tr.* XIII, 269.)

It naturally occurs to the mind, that, if the *Tennu* really exists, it would long ere this have been discovered, in all probability, in the neighbouring Malayan peninsula: but how little is even now known of the great animals inhabiting that peninsula! The late Dr. Cantor, when he wrote his Catalogue of the Vertebrated Animals of the Malayan peninsula, was unaware of the existence there of Bos SONDAICUS in addition to B. GAURUS, only includes a two-horned Rhinoceros on the testimony of the Malays, and whether the ELEPHAS SUMATRANUS occurs on the mainland of Asia (like the Tapir and the two insular species of Rhinoceros, the Bos SONDAICUS and others,) is still undetermined. It is possible enough, though doubt-

less rather improbable, that such an animal as the *Tennu* may have escaped observation there even to this time. But it might not extend its range into the peninsula (as in the instance of the large *Siamang* Gibbon, which is peculiar to Sumátra); and not very much has been accomplished in the investigation of the zoology of the great island of Sumátra since the time of Raffles. At all events, I think the present opportunity a meet one to reveal the subject to notice.

Baron Cuvier long ago remarked, I think in his *Leçons dans l'Anatomie Comparée*, that even then it was not probable that any more existing large quadrupeds remained to be discovered: and it is worthy of notice that no remarkable genus of large quadruped has been since brought to light, though additional species have been discriminated of several of the old genera. The small HIPPOPOTAMUS LIBERIENSIS of the late Dr. Morton is scarcely an exception; although since raised to generic rank by Dr. Leidy, by the name CHŒROPSIS.* Of the three genera containing the most bulky of existing land quadrupeds, additional species have been distinguished; though, for the most part, they may not yet be universally accepted. Of ELEPHAS, the E. SUMATRANUS, Temminek and Sehlegel (to which Sir J. Emerson Tennent refers the Ceylon Elephant†). Of Rhinoceros, a

* *Journ. Philad. Acad., n. s.*, I, 231, II, 207.

† The grinders of ELEPHAS SUMATRANUS are said to be intermediate in form to those of the Indian and African species; and I have just purchased a pair of table-weights, formed each of a thick horizontal section of an Elephant's molar-tooth, which seem to me to be of this species. The little boxes formed of sections of Elephant's molars, which are commonly brought from Galle, are (so far as I have seen) of the Indian species; but these are not necessarily from Cinghalese individuals. It is worthy of remark, however, that whilst among the Elephants of Sumátra and Borneo fine *tuskers* would appear to be common (and the ivory is an article of export from both islands, as I am assured by a gentleman who has collected the article in Borneo), they are exceedingly rare among the Elephants of Ceylon; where, nevertheless, it has been suggested that tuskers are so much sought after that they are seldom permitted to develope their ivories.

With reference to Sir J. E. Tennent's speculation regarding the former continuity of land between Sumátra and Ceylon—and Africa, of which the intermediate character of the ELEPHAS SUMATRANUS is one of his presumptive proofs, it may be remarked that the *two-horned* RHINOCEROS SUMATRANUS (with its only slight skin-folds) interposes a link between the two-horned and smooth-skinned African and the single-horned and mail-clad Asian species; but (not to allude further to the alleged existence of a single-horned African species) the presence of the second horn in RH. SUMATRANUS is much less remarkable, when we bear in mind the several fossil two-horned species of Europe and Asia, to which moreover the existing two-horned Asiatic Rhinoceros is much more nearly akin than it is to the different African two-horned species, as before remarked.

second black African species, the Rh. KEITLOA, A. Smith (long previously indicated by Sir J. Barrow by the name *Jckloa*), and a second white African Rhinoceros, the (Rh. OSWELLII, Elliot),—besides the Rh. CROSSII, Gray (founded on the horn only, and the habitat of which is unknown); and of HIPPOPOTAMUS, the species of N. and S. Africa, respectively, are distinguished by Dr. Leidy and others (sinking *H. senegalensis*, auct., as a synonyme of the former), and there is also the H. or CHŒROPSIS LIBERIENSIS, which is a most undoubted species, considered—as we have seen—entitled to generic rank by Dr. Leidy. Whether external differences exist between the great Hippopotami of N. and S. Africa, remains to be shewn; as also in the case of the European and American Beavers, which Owen separated on account of differences in the configuration of the skull: in another animal first so discriminated, the PHASCALOMYS LATIFRONS, Owen, good external distinctions have since been discovered, which characterize it well apart from the Ph. WOMBAT. Of other *Pachydermata* of Cuvier, more EQUI (of the *Asinine* type) have been added to the list; and several species of Swine. Among the *Bovine* ruminants, the three species of flat-horned *Taurine* cattle proper to S. E. Asia have only recently been properly distinguished;* also the BUBALUS BRACHYCEROS of intertropical Africa; and there are others (as I believe) not yet sufficiently established, and more species also of large Deer and Antelopes. Among the *Carnivora*, no animal worthy of much note, unless *Phocidæ* (as might have been expected); and ditto with *Cetacea*—my BALÆNOPTERA INDICA for example (which is perhaps the largest of existing animals,—but these latter

Prof. Owen, in his late minute—'On a National Museum of Natural History,' (which I have only seen since penning the above,) writing of this genus, remarks—"There is also a two-horned Rhinoceros in Sumátra; and the Rhinoceros of continental India is one-horned, as is that of the island of Java." He would appear thus to consider the Rh. SONDAICUS and Rh. SUMATRANUS as exclusively insular species. He further adds that—"The two-horned Rhinoceros of Sumatra offers, of all living Rhinoceroses, the nearest resemblance to certain fossil kinds found in Europe. When half-grown, this Rhinoceros retains a conspicuous coat of short, straight, bristly hair. It is generally known that one, at least, of the extinct European Rhinoceroses [Rh. TICHORHINUS] was covered with hair when full-grown. * * * What I have said of the Rhinoceros applies to the Elephant. Bishop Heber's first announcement of the young hairy Elephant which he met with in the Himálaya mountains excited much surprise. This character, transitional in the modern Elephant, was persistent in the Mammoth, or northern Europeo-Asiatic Elephant." The RHINOCEROS TICHORHINUS, it may however be noticed, is stated to have had no skin-folds.

* Dr. S. Müller unites the three in his description of BOS SONDAICUS!

are not four-limbed). Among the *Quadrumana*, the grandest of all—the huge Gorilla—has been re-discovered; for its reputed existence was regarded as fabulous by Baron Cuvier. Lastly, in the bird class, it is most remarkable that the number of *brevipennate* species has quite recently been more than quadrupled*:—still, however, no remarkable new genus, excepting the New Zealand Moa; and of this at least two species have just been discovered to maintain a lingering existence, as I have learned from a letter recently received from Mr. E. L. Layard, who is at present in New Zealand as Private Secretary to Governor Sir G. Grey. One of these, of comparatively small size (about 3½ ft. high), has actually been killed and eaten by a famishing party of explorers and *fifteen* others seen. Of the other, one of the large Moas, only the fresh foot-steps (15 in. long) have been traced, as Mr. Layard states by a party who had lost themselves; and therefore the instance does not appear to be the same as that lately recorded in the *Zoologist* (p. 7847). Both of these living species inhabit the little explored Middle Island.†

March 1*st*, 1862.

* *Vide J. A. S.* XXX, note to p. 92. Even a *sixth* Cassowary has since been added by the Baron von Rosenberg of Amboyna. It is from the island of Salawatti; and has *no wattles*, as in all the others. He terms it Casuarius Kaupi. Vide *Ibis*, July, 1861, p. 312. The Balæniceps rex must be considered as a remarkable discovery among large birds; and this is quite a new genus.

† The notice in the *Zoologist* is copied from the *Nelson Examiner* of July 12th, 1861. It is as follows:—"About three weeks ago, while Mr. Brunner, Chief Surveyor of the province, and Mr. Maling, of the Survey Department, accompanied by a native, were engaged in surveying on the ranges between the Rewaki and Takara rivers, they observed one morning, on going to their work, the foot-prints of a large bird, whose tracks they followed for a short distance, but lost them at length among rocks and shrub. The size of the foot-prints, which were well defined wherever the ground was soft, was fourteen inches in length, with a spread of eleven inches at the points of the three toes. The foot-prints were about thirty inches apart. On examining the bones of a foot of a Moa in the museum, we find the toe to measure, without integuments, eight inches and a half, and those evidently form part of a skeleton of a very large bird: the length of the impression of the toe of the bird in question was ten inches. The native who was in company with Messrs. Brunner and Maling was utterly at a loss to conjecture what bird could have made such a foot-print, as he had never seen anything of the kind before. On a subsequent morning similar marks were again seen, and, as a proof that they had been made during the night, it was observed that some of them covered the foot-prints of those which the party made the preceding evening. The size of these foot-prints, and the great stride of the supposed bird, has led to a belief that a solitary Moa [why one only?] may yet be in existence. The district is full of limestone caves of the same character as those in which such a quantity of Moa bones were found, about two years ago, in the neighbouring district of Asrere. We believe that it is the intention of the Government to take steps to ascertain the character of this gigantic bird, whether Moa or not, which keeps watch in these solitudes."

P. S. No. 1. In a letter dated May 10th, from Bangkok, just received from Sir R. H. Schomburgk, he writes—"Will you believe me, I have never met with an example of that formidable animal, the Rhinoceros! They are more towards the east, in Cambodia and Anam, although they are likewise to be met with in the north; for, amongst the remarkable events of 1860, Dr. Bradley notes, in his 'Siamese Calendar' under April 5th, that—'A Rhinoceros was brought to the city from the north. Though a great curiosity, it was little thought after, because of a prevalent notion that his way had been heralded by the cholera, and that the effluvia from his body was almost sure to give that disease.' They are strange people, these Siamese:

Mr. Layard further writes, that—"The fabulous Otter of the natives [*qu.* a species of ORNITHORHYNCHUS?] has also been seen and shot at by Europeans; and a new large green Ground Parrot; also a huge land shell (not HELIX BUSBYII), on the tops of fir-trees on the same island."

Since transcribing the above, I find that a further notice of the existing great Moa appears in the 'Proceedings of the Royal Geographical Society of London,' Vol. VI (1862), p. 25. It is a repetition of the account in the 'Nelson Examiner.' Mr. T. H. Hood, Member of the Legislative Council of Queensland, writes to Lord Ashburton,—"There is said to be a possibility that the British Museum may still be adorned by a DINORNIS: the footsteps of a gigantic bird, it is stated, were seen by a surveyor's party; they were 14 inches long, and 11 in. wide on the spread, and they had been impressed during the night over the tracks of the men made on the previous day. All the wingless birds existing in New Zealand are nocturnal in their habits; and the general impression from Maori tradition is, that the Moa was a gigantic APTERYX. The district is exceedingly rocky, and full of caves, in some of which it is just possible that a surviving individual may find its hiding-place. Exertions are being made (the last steamer's mail brings us intelligence) to ascertain the truth of the report, and, if correct, thoroughly to search the wild and unsettled districts where it is said to be. Certainly this would be a most interesting event to naturalists, should the search prove successful. I must say that I feel somewhat sanguine on the subject; as once, when in that part of the Middle Island, I heard of a very circumstantial account given by a man, who stated that he had seen a great bird go down into a rocky glen one morning at daybreak; but the story was not credited. The surveyor who now makes the statement is understood to be a man of character."

For a Report on the four ascertained living species of APTERYX, by Mr. P. L. Sclater and Dr. F. von Hochstetter, *vide* 'Natural History Review,' October, 1861, p. 504.

"Let me again refer," remarks Prof. Owen, "to the ratio at which the zoologist's knowledge of the class [*Mammalia*] has proceeded of late years; viz. from, say, 1,350 species in 1830, to 2,000 in 1855, and 2,500 in 1860. In one order, *e. g. Marsupialia*, the increase has been, from 50 species, recorded in 1830, to 350 species, in 1860. We should greatly over-estimate our present knowledge were we to rest upon it a conclusion that there remained but very few more forms of mammalia to provide room for in our museums. Look, for example, at the recent unexpected augmentation of the species of the quadrumanous order, by the researches made by Dr. Savage and M. du Chaillu, in a limited, but previously unexplored, tract of tropical Africa,—species including the largest as well as the most highly-organized forms of the order that comes nearest to Man." (*Athenæum*, July, 1861, p. 120.)

while the rasped horn and the coagulated blood of the animal are considered remedies in various diseases, they consider its effluvia as dangerous to the health."

P. S. No. 2. I am just able to insert the following extract from a letter, posted at Galle, from Mr. W. T. Blanford (now on his voyage to Suez). He writes—"It may be interesting to you at the present moment to know that the Rhinoceros of the Shan hills east of Ava is one-horned. The people at the capital assured me that two-horned Rhinoceroses were [there] unknown. The Rhinoceros of the southern portion of the Arakan hills is two-horned. I am not sure that the one inhabiting the higher portion of the hills on the Pegu side, and of which I once or twice saw tracks in the Henzada district, is identical. The tracks appeared to me to be larger [as those of RH. SONDAICUS would be].

"I was told at Mandalé of a wild Horse (or a wild Ass) on the mountains of Theinin in the Shan states east of Ava. I at first thought that only the *Næmorhædus* [CAPRICORNIS] was meant; as that animal is known in Pegu, but not in Upper Burmá, as the 'wild Horse.' My informant, however, when I suggested this, said that he knew the 'wild Goat' perfectly well; and that the animal he referred to was a wild Horse, or perhaps, he added, *rather a wild Ass than a wild Horse.* Can this be the *Kyang* of Tibet?"

P. S. No. 3. When I referred to the ELEPHAS SUMATRANUS in p. 165 *antea*, I had not seen Prof. H. Schlegel's paper on this animal, a translation of which is published in the 'Natural History Review' for January, 1862. This I have chanced to light on, just in time to avail myself of it here. To Prof. Schlegel is due the identification of the Cinghalese Elephant with that of Sumátra: and, according to this naturalist,—"It is well known that Sumátra is the only island of the Indian Archipelago, where Elephants are found wild. Magelhaens has informed us, that the Elephants which he saw in Borneo, were introduced there; and that the animal is as little indigenous to that island as to Jáva." From the information which I have received, however the statement of Magelhaens may hold true that the tame Elephants which he saw in Borneo were imported animals, it seems improbable that the race now wild upon that great island, and at this time sufficiently numerous in individuals

for their ivory to be an article of commerce, can have descended from an imported stock. My principal informant on the subject, to whom I have applied for what further information he may be able to give me, is Capt. Mottley (at present of Akyab), brother of the naturalist whose name is associated with that of the Rev. Mr. Dillwyn in Messrs. Mottley and Dillwyn's 'Fauna of Labuan' (and who perished with his family in the massacre at Banjermassing). Capt. Mottley was long associated with his late brother, as he mentioned to me in conversation, when I was at Akyab. In a paper on Borneo published in the 'Singapore Chronicle' for December, 1824 (and reprinted in Moor's 'Notices of the Indian Archipelago'), we are told that—"Of land animals, there exist the Elephant, the Rhinoceros, a species of Leopard [FELIS MACROCELIS]—but not the royal Tiger," &c. &c. "The first three animals, it is singular enough, are found only in a single corner of this vast island, its northern peninsular extremity, in the districts of Ungsang and Paitan. * * * The Ox [BOS SONDAICUS], under the name of *Tambadao*, is a native of the forests of Borneo; and so is the Hog" [SUS BARBATUS]. In a sketch of Borneo, or *Pulo Kálámantan* (the Malayan name of the entire island, as distinguished from its province of *Borneo*), communicated by J. Hunt, Esq., in 1812, to Sir T. S. Raffles, then Lieut.-Governor of Jáva, (and also reprinted in Moor's 'Notices of the Indian Archipelago,') it is stated that—"The Elephant was said to be seen about Cape Unsing, where several teeth are still found; but it is conceived that this animal is extinct on the island." These are the only printed notices that I can at present recal to mind, relative to the existence of Elephants in Borneo.

The only species of Elephant, which, according to our present knowledge, is known to inhabit *India* proper—as distinguished from Indo-China and Malasia (or Malayana),—Prof. Schlegel designates as the "so-called ELEPHAS INDICUS;" and he remarks, that, so far as he "could discover, the greater number of Elephants brought to Europe from continental India, have been obtained from Bengal. It remains therefore a question," he adds, "whether all the Elephants of continental India belong really to one species, or whether, in these widely extended regions, there may not be different species of Elephants, and the Elephant of trans-Gangetic India may not perhaps belong to E. SUMATRANUS. A similar question may be asked

with respect to the Elephant of Southern India, compared with the E. SUMATRANUS of Ceylon, since these districts approach one another very nearly. We have, it is true, no more reasons for answering these questions in the affirmative than the negative; but they must be determined by ascertaining the facts, in order to know the exact boundaries of the range of E. INDICUS."

On this subject, I have to remark, that (at the present time at least,) the Elephant is quite as much an imported or introduced animal in Bengal proper, as it is in Jáva; for the very few that roam the Rajmahál hills are known to be animals escaped from their quondam human owners, and perhaps there may be some that are the progeny of such escaped animals. The appellation of "Bengalese Elephant," habitually made use of by Prof. Schlegel, is therefore inappropriate; although wild Elephants do exist, chiefly on the eastern outskirts of the province, and along the base of the Himálayas. I have not had the opportunity of examining the grinders of wild Elephants from the peninsula of India; but I have lost no chance of examining those of wild Burmese Elephants, which indicate the species to be INDICUS, as distinguished from SUMATRANUS. Even here I must remark, that the tame Elephants employed at Moulmain, so celebrated for their intelligence in piling timber, &c., (which feats I have witnessed,) and also those extensively employed in the teak-forests of the interior, are brought down all the way from the Shan states; the Burmese method of *hunting* wild Elephants proving successful only in procuring small individuals, below the commissariat standard, and unequal to the labours imposed by the timber-merchants. The entire Indo-Chinese region (or 'trans-Gangetic *India*,' though even 'Hither China' would much better express the affinities of the human inhabitants,) would appear to be emphatically the main *habitat* of E. INDICUS, seemingly extending down the Malayan peninsula in one direction, and along the southern base of the Himálayas in another: there are still many in the Deyra Doon; and others in Cuttack, Central India, Malabar, &c., which it has now become desirable to examine more critically.

According to Professor Schlegel,—"The Elephant of Sumátra and Ceylon (E. SUMATRANUS) has small ears, like E. INDICUS; and approaches this species also in the form of its skull, and the number of the caudal vertebræ: but the laminæ of its teeth are wider; and

in the number of its dorsal vertebræ and pairs of ribs, it differs from both the other known species. As far as we know, there are seven cervical, three lumbar, and four sacral vertebræ in all the species of ELEPHAS alike. E. SUMATRANUS and E. INDICUS agree in the number of caudal vertebræ, which is usually thirty-three, but in very young examples sometimes only thirty. In E. AFRICANUS, on the other hand, the tail never contains more than twenty-six vertebræ. Finally, the number of dorsal vertebræ and pairs of ribs are different in each of the three living species of Elephant; being in E. AFRICANUS twenty-one, in E. SUMATRANUS twenty, and in E. INDICUS nineteen.*

"It is also remarkable, that the number of true ribs is alike in all the species, that is, only five; whilst in the three species, as above given, the corresponding numbers of false ribs is fifteen, fourteen, and thirteen. Hence it follows that the augmentation of these parts, in the different species, takes place in the direction of the hindmost dorsal vertebræ and pairs of ribs.

"The laminæ of the teeth afford another distinction, which, however, is less apparent to the eye than that taken from the number of the vertebræ. These laminæ, or bands, in E. SUMATRANUS are wider (or, if one way so say, broader in the direction of the long axis of the teeth,) than in E. INDICUS. In making this comparison, one must remark that the distinction is less evident in younger individuals; and that there are met with, in all species of Elephants, within certain definite limits, remarkable individual differences in respect of the width of these laminæ.

"In their external form, also, the two Asiatic Elephants appear to present some differences. Heer Westerman, Director of the Gardens of the Zoological Society of Amsterdam, which has for several years possessed two female Elephants of moderate size, one [received] from Calcutta and the other from Sumátra, informs me, on this subject, that the Sumátran animal is more slender and more finely built that the Bengalese [wherever that might have originally come from!], that it has a longer and thinner snout, and that the rump at the end is more broadened and covered with longer and stronger

* The skeleton of ELEPHAS INDICUS in the Society's museum, and also that in the museum of the Calcutta Medical College, are those of the true continental species, according to Professor Schlegel's diagnosis.

hairs, in which respect it reminds one rather of the African than the Indian Elephant, and, lastly, that the Sumátran animal is more remarkable for its intellectual development than the Indian.*

"The last mentioned observation agrees, in a remarkable way," continues Prof. Schlegel, "with what Heer Diard has lately written concerning the Elephant of Ceylon. He says, on this matter,—"l' Elephant de Ceylan se distingue de celui des Indes par une aptitude d'intelligence instinctive, celle de facile éducabilité: aussi ces Elephans de Ceylan, de tout temps recherchés par les Princes de l'Inde se trouvent l'être encore aujourdhui plus qu' áucun outre par les Anglais pour les differens serviees auxquel on les employe. Jái eu l'occasion d'observer pleuseurs grandes troupes de ces animaux et une particuliérement, qui avais finie par se laisser prendre dans une grande enceinte établié par les ordres du Gouvernment, qui a eette époque ou la guerre de l'Inde était encore loin d'etre terminée faisait tout ce qu'il est possible pour recruiter un certain nombre de ces animaux afin de les deriger vers le Bengale."

From my own familiar observation of the intelligenee of tame Elephants, whether in Lower Bengal, Oudh, or Burmá, I am inclined to doubt exceedingly the alleged fact of the superior qualities, in this respect, of the Cinghalese Elephant. Individual differenees occur, no doubt, as in other animals; and no slight diversity of charaeter. I also do not remember that any Elephants arrived at Calcutta from Ceylon during the period of the repression of the Indian mutinies; though some may have been sent, likely enough, from that island to Madras. The grand importation, at that time, of Elephants into Calcutta was from the ports of Rangoon and Moulmein; and the animals in question were brought thither from the Shan states beyond the British boundary.

The assigned *habitat* of Caleutta for a tame Elephant may be estimated from the following extract:—

Col. A. P. Phayre, now Chief Commissioner of British Burmá, remarks, in his 'Report on the Administration of the Province of Pegu' during 1858-9, that—"Not less than one thousand and thirty-four (1,034) Elephants have been shipped from Rangoon and Moulmein, for the Madras eoast and Bengal, during the period extending

* It may here be noticed that Prof. Schlegel has reason to suspect the existenee of more than one species of African Elephant.

from Dec. 1857 to April 1859. It may be assumed," continues Col. Phayre, "that so many of these powerful animals were never before, whether in ancient or modern times, conveyed across sea, or otherwise from one country to another, in the short period of seventeen months, whether for military or other objects." And of this great number, it may be added, that not a single one will probably have propagated its race after its capture! A young Elephant was born, I learned, on its voyage from Moulmein to Madras, survived the voyage, and was alive a year or more afterwards, if not at the present time, as is most probably the case.

On application to the Military Commissariat Office, I am obligingly informed that—"The following is an account of the Elephants received in Calcutta from Moulmein and Rangoon.

	"*Moulmein.*	*Rangoon.*
"1857	20	50
1858	422	34
		84
1859	300	
	742	742

"In all 826

"I do not know," continues my informant, "how many more were landed in the Madras Presidency.

"No Elephants were received at Calcutta from Ceylon."

The accuracy of the foregoing statement may be fully relied on.

P. S. No. 4. The genera Elephas and Rhinoceros were placed by Linnæus (Gmelin's *edit.*, *A. D.* 1788,) in his order *Bruta;* while he associated the Horse with the Hog and the Hippopotamus in his order *Bellua.* It is remarkable, too, that he refers to Rhinoceroses bearing a third horn.* Báber, it has been remarked, hunted some species of Rhinoceros on the banks of the Indus; and in Dr. Parsons's description of a Rhinoceros procured when young by "Humphrey Cole, Esq.; being Chief of the Factory of Patna in Bengal," in the *Phil. Trans.*, Vol.

* To his description of *Rh. bicornis*, it is added—"Rarior est *Rhinoceros tricornis, tertio tum cornu ex alterutro priorum excrescente.*"

XLII (*A. D.* 1742-3), we read of "many Gentlemen, who had seen those Creatures in *Persia*, and other Parts of the East." Can this reference to Persia be a mistake? Or were such animals, at little more than a century ago, occasionally conveyed (when young) from the *Indus* to the Persian Gulf? Rather than from the eastward of Cape Comorin? Were it not for the locality assigned, I should have been inclined to suspect that Parsons's figures were intended for Rh. sondaicus, from the somewhat greater elevation of the limbs, the more evenly (though too coarsely) tuberculated hide, and especially the delineation of the nape region, as compared with the figures by Edwards, Buffon, and Cuvier and Geoffroy. At the same time, I have already noticed, that the hide of the Lesser One-horned Rhinoceros of Bengal is by no means so neatly tessellated in appearance as is shewn by Dr. S. Muller's figure of the Javanese Rhinoceros.

I find that I was wrong, in p. 163 *antea*, in stating that our Rhinoceros-skeleton was presented by a late Nawáb Nazim of Bengal. Three skeletons, those of Elephant, Camel, and Tiger (the last now replaced by a much finer one), were presented in 1839, by His late Majesty of Oudh, Nussir-ud-Dowlah, *J. A. S.* VIII, 688. For the history of our Rhinoceros-skeleton, *vide J. A. S.* III, 142, IX, 518, X, 928. The animal was killed in the Jessore district.

On some Bactro-Buddhist Relics from Ráwal Pindi.—By Bábu Rájendralála Mitra.

In February, 1861, Capt. Stubbs, of the Artillery, forwarded to the Asiatic Society, through Col. J. Abbott, draughts of certain interesting relics found in a field 23 miles to the north-west of Ráwal Pindi, and between the villages of Shah ke Deri and Osman Khatur. The place is said to be rocky and covered for many miles with fragments of dressed stones and ruined buildings which have, in some spots, formed mounds of considerable height, overgrown with jungle. Traces remain of some of the buildings having been made of quarried stones with lime mortar. Copper coins and fragments of statuary are also met with. The relics under notice were exhumed by two zemindars of the place while digging among some mounds in quest of treasure. They had been evidently deposited in the centre of a masonry building, the foundation of which was met with at the

depth of 2 or 3 cubits from the surface of the ground. Mr. G. D. Westropp, Extra Assistant Commissioner, Ráwal Pindi, to whom they were made over by the discoverers, states that they consist of—

"1st, a circular stone trough about one foot in diameter and three inches in depth, beautifully turned and polished. Its outer resemblance is that of a large cone cut away at $3\frac{1}{2}$ or 4 inches above its base. The trough has three grooved circles diverging from the base of a small cone which rises about $1\frac{1}{2}$ inches from its centre. The rim, sides and bottom of the vessel are not more than $\frac{1}{2}$ an inch in thickness. The stone is of a dark green colour, interspersed with white spots, and from this circumstance, as well as from its hardness, I am led to conclude that it is either porphyry or some other description of granite. It is remarkably free from flaws and defects."

"2nd, a crystal figure which was inverted on the small centre cone described above. The figure represents the shape, wings and tail of a duck with the head of a turtle. It is delicately carved, and in a state of good preservation.

"3rd, a piece of gold leaf about three inches long, by one broad, bearing an inscription in some unknown character. The letters are in relief and perfectly clear and distinct."

Fig. 8 of the accompanying plate represents a reduced sketch of the trough. It differs from the Manikyala and other Buddhist vases in being the segment of a cone and not of a cylinder, and in having the peculiar conical projection in the centre, the counterpart of which has nowhere else been noticed. Neither Mr. Westropp nor Col. Abbott makes any mention of a cover for this trough, but judging from the perfect state of preservation of the crystal figure and the gold leaf, and also from the circumstance of all the memorial troughs or basins hitherto discovered having been supplied with lids, I believe this too had one which was probably destroyed in the act of exhumation. Its exact dimensions are, upper diameter 11 inches, lower do. 12—7; depth within 1—85; depth outside 2—4. It probably contained the ashes or some other mortuary remains of the saint whose name is recorded on the gold leaf.

The crystal figure is a well formed round cup bearing the head and tail of a duck, with the wings indicated by cross lines on the sides. It measures 4 inches in length and 2-7 in breadth, the height being 1-8. The interior diameter of the cup is 1-8 and its depth 1-2. Fig.

Fig. 1

Fig. 3

Fig. 2

Fig. 5

Fig. 4

Fig. 6

Fig. 9

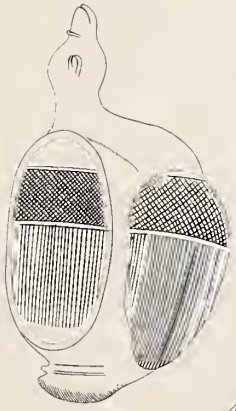


Fig. 7

Fig. 10

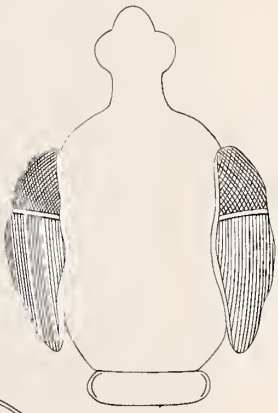


Fig. 8

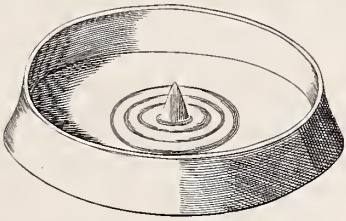
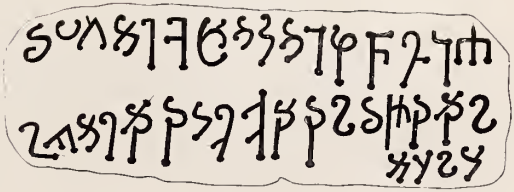


Fig. 11



9 is a reduced sketch of its side view, and Fig. 10 of its under surface. The places of the feet are indicated by two holes on each side, and at the centre of the tail there is a small perforation: the cup has a flaw under the neck.

As a funeral or Buddhist emblem I have never noticed a duck; and among the figures published by Mr. B. H. Hodgson in the Transactions and Journal of the Royal Asiatic Society of London,* the peacock and the hawk are given as Buddhist signs, but no anserine animal of any kind. A story is current, however, that when S'ákya shed his top-knot at Benares, his hairs assumed the form of a flock of geese, which flew away towards the north, and it is possible that the figure under notice, was designed to commemorate that event in the life of the founder of Buddhism. But the inscription is entirely silent on the subject. It records the death of a saint who, notwithstanding the distinctive epithet of Bhagava, was evidently not S'ákya himself, and it would not be consistent to suppose that the record and the emblem allude to two different individuals. I feel disposed to think, that they refer to the same person. This idea gains strength from the circumstance of superior intelligence having been assigned to the duck under the name of *hañsa* in the Hindu Shástras. The Chhándogya Upanishad gives an anecdote of two geese, one of which, while flying over a palace, warned its companion to keep clear of the majesty of the king below. The Rámáyaṇa and the Mahábhárata, have likewise several anecdotes in which *hañsas* are alluded to. In a curious work on omens by Vasantarája (8th section) it is said that "the sight of a *hañsa* in any direction, when proceeding on an expedition, is a sure augury of success. The hearing of its cackle is likewise efficacious, while its name is destructive of all sin."† In another place it is said, that "the cackle of a duck (if heard by a man only once when proceeding on an expedition) is an augury of thieves in the way; if heard twice, of gain; if thrice, of danger; if four times, of war; and if five times, of royal favours."‡

* T. Vol II. p. 222, J. vol. XVIII. p. 393.

† काष्ठासु सर्व्वास्वपि दर्शनेन हंसस्य शब्देन तु सर्व्वसिद्धिः।
नामानि हंसस्य गृणोति यस्तु प्रयान्ति नाशं दुरितानि तस्य॥

‡ चौरैः समं दर्शनमाद्यशब्दे निधिर्द्वितीयेऽथ भयं तृतीये।
युद्धं चतुर्थे नृपतिप्रसादः स्यात् पञ्चमे हंसरवे नराणाम्॥

According to popular belief the hañsas have the peculiar power of abstracting the milk from a mixture of milk and water, and leaving the water behind. Absurd as this belief is, it has led to the hañsa being reckoned as an emblem of superior powers of discrimination, and seldom does a Bengali author write a book in which he does not request his readers to separate, like the hañsa, the cream of his composition from its aqueous adjunct. In the Mahábhárata this is alluded to in the Udyoga Parva* where a great Bráhmana teacher is named the *Hañsa* or "the goose" who was to separate the cream of theology from the dross of secular learning. It is probably from this circumstance that the term, from originally meaning "a duck," "a goose," "a swan," or "a flamingo"† came to mean the omniscient Brahmá,‡ the benign Vishnu, the plenipotent Siva, the all-observing sun and, metaphorically in composition, "the best," "chief," or "excellent." The Jogis took it up as a term elect to indicate the vital airs, and many mystical prayers were got ready for the adoration of the deity as the *Hañsa*.§ Those who adopted this mystical prayer were generally ascetics, and hence several sects of Jogis used it as a title for their spiritual teachers. Subsequently the term had the augmentative prefix *parama* added to it, and in that compound form, it occurs frequently in the Bhágavat where S'ridhara Swámi explains it by the words सारासार-विवेक-निपुणः or "possessed of the knowledge of substance and dross, or truth and untruth." When the term came to be used as indicative of a Vedantist ascetic it is difficult to determine, but it occurs very largely in the polemical literature of mediæval India. However ridiculous the title may appear in its English version of "the great goose," S'aṅkara adopted it as pre-eminently his own,‖ and most of his successors called themselves *Paramahañsas*. Several teachers of great eminence before the time of Sañkara likewise had the same title, and it may be traced

* Chapter 35, Vol II. p. 137.

† Vide my translation of the Chhándogya Upanishad p. 66, foot note.

‡ The vehicle of Brahmá is likewise named hañsa.

§ हंसेति प्रकृतिर्ज्ञेया ओङ्कार प्रकृतेर्गुणाः।
हङ्कारेण बहिर्याति सकारेण विशेत् पुनः॥

‖ The following is his definition of hañsa as given in his treatise on inference, *Aparokhánubhuti*.

क्षीरान्नीरं पृथक् कृत्य हंसो भजति नान्यथा।
क्षीरनीरविवेकज्ञो हंस एव न चापरः॥

as far back as the 7th century. In its simple form it must have been in use long before that time, and as the Jogis, as a sect, are of very ancient date and notices of their rigorous penances occur in books many centuries before the commencement of the Christian era, it would not be too much to suppose that the term *hañsa* was well known at the time when the Bactrians held sway in Western India. If this be admitted, bearing in mind the well-established fact of the Buddhist having borrowed most of their terminology from the Hindus, it would not be unreasonable to suppose that the duck under notice, was placed in the monument as an emblem of the superior intelligence of the saint whose memory it was to perpetuate.

The inscription (Fig. 11) is in Arian characters, its language being Páli, similar to that of the Kapur-di-giri edicts of As'oka, and the Wardak record of the time of Huvishka. The letters have been punched on the gold leaf, and are in an excellent state of preservation, but several of them are peculiar in shape, and the difficulty of ascertaining their phonetic values throws much doubt on the meaning of the whole record. Moreover in the Arian alphabet, as far as yet known, four different letters either by themselves or with their vowel-marks, appear very much alike, and they constantly lead to misapprehensions and mistakes. They are all formed of an oblique line bending to the left with a top stroke more or less curved. The letters alluded to are *v*, *r*, *t*, and *b*. Of these *v* perhaps is the most characteristic with its perfectly horizontal top line, and yet it is liable to be mistaken for an *r*; the *r* is liable to be confounded with *t* and *b*, and the *t* has a strong tendency to merge into *b*. The *l* too in the first line of the Kapur-di-giri inscription has some resemblance to *b*. The *v* stands at the fourth remove from *b* and is not often liable to be mistaken for it, nor for a *t*, and yet when the horizontal top stroke is modified by a perpendicular stroke at its end to indicate the long vowel á, nothing save the context is left to guide the decypherer to their values, and even that dubious guide fails him whenever he has an unknown proper name with any of these letters before him. I feel myself, therefore, in my reading of the record, freely open to correction, and if I publish it in its tentative form, it is only to provoke enquiry, and to assist the researches of others into a subject fraught with the deepest interest in connexion with the history of Bactrian domination in India. I presume not to apply the "verifying faculty" so as to convert the plausible into the certain.

The first word of the record appears to be distinct enough; the syllables are *s'i, ri* and *e* = *s'irie*, the singular dative in Páli of *s'ri;* the meaning being, "For the sake of prosperity." The first and the third syllables are undoubted, the second may be read *ti, vi*, or *ri* at option, the *t, v* and *r* being, as aforesaid, liable to be confounded.* It has been taken for *ri* because no meaning can be got with *vi* or *ti*. Besides, in Oriental writings the word *s'ri* is always reckoned to be an appropriate beginning for a grave document, as it is supposed to be highly conducive to prosperity. The second word is *Bhagava*. When I first met it in the Wardak monument, I had some doubts about my reading, and I adopted it only on the analogy of the Burmese vocative of Bhagavan, but in Major Kittoe's collection of unpublished inscriptions, there is a Páli record in the Lát character, which has the word very distinctly in two places, and there seems to be no reason to object to it any longer.

The syllable immediately succeeding Bhagava is of a very doubtful appearance. It makes the nearest approach to a *bo*. In Mr. Thomas's plate† the lapidary *b* is written thus ৳, and if the vowel mark for *o* be put about its middle it would be changed to a shape, which would be very nearly that of the letter in the inscription. The vowel cannot be *u*, as that letter in the Kapur-di-giri record is given in a different way with a horizotal stroke at foot. The *dha* after it is undoubted, and then the first syllable is repeated. The *prá* which follows next is well formed and not liable to be questioned, but what the next syllable is, is quite uncertain. Taking it at a random for a *jña*, the whole word becomes *Bodhaboprájña*. Placed immediately after *Bhagava*, the word is expected to be the name of the saint whose death the record has to commemorate, but placed between two such pure Sanskrit terms as *Boddha* and *prájña*, it is not easy to account for *bo*, one feels disposed therefore to suppose that either it is a misscript for *bi* which is a very appropriate Sanskrita expletive meaning "certainty" and corresponding to the English adjunct *di* or *dis;* or the *jña* is a mislection of something else which with *boprá* made a proper noun, but what that is cannot now be guessed. If the syllable *bo* be taken for *te*, no advance whatever is

* The facsimile prepared from a sealing-wax impression is not correct here. The original gold leaf has *ra* and not *ri*.

† Prinsep's Indian Antiquities, p. 166.

made towards an explanation of its meaning, and the *te* itself is generally written in a very different way. In the Behat Kunanda coins, the *jna* occurs in the form of an h reversed, while the form of the letter in question is like a double v, व्व. If it be taken for the latter it would make the name Bodhaboprávva or Boddhateprávva, but without making any advance to its meaning: the word, however, being a proper noun, its meaning cannot be of much help, and I despair, therefore, of coming to the right reading without extraneous aid. The next word is *rátiyámaü*, *ráti* for *rátri* "night," *yáma* "a watch," or one fourth of the night, it being usual in India, as elsewhere, to divide the night into four watches. The *u* is supposed to be doubtful. I take it to be the case-mark for the locative. In the Lalita Vistara it is very largely used to indicate the omission of a case affix, and in the Hindi it is also met with.* The meaning of the whole clause is "in the first watch of the night."

The second line begins with a word which may be taken for "drinking of joy" or "drunk with joy," from *hasisa* "laughter" and *piü* "drinking" or "having drunk." The radicals of both the words are well known, and the only thing doubtful is the *si* in *hasisa*, particularly as the next word *hasasila* "laughing" or "joyous" is written without the *si*. The next word is *iva sasi* or "like the moon," from *iva* "like" and *sasi* "the *moon*;" the letters are distinct and the meaning undoubted. The syllables which follow to the end of the line, are likewise distinct, except the last which looks more like *hra* than *ha*. Taking it to be *ha*, on the authority of the Kapur-di-giri record in which *h* sometimes occurs with a prolonged tail,† the question arises as to the property of using the word *yoha* "a flock" or "herd" with reference to men, in Sanskrita the use of its radical *yuha* being confined exclusively to beasts and birds. But perhaps it would be conceded that for a saint to call his pupils his "flock," or for his pupils, disciples, and congregation to describe themselves as "his flock" even against the genus of the Sanskrita, is not such as to raise any serious obstacle to taking the word in that sense. The meaning would be "rising above his flock." The last word of the record is

* Vide my paper on the Gáthá Dialect, ante vol. XXII. p. 608.

† Since writing the above I have had an opportunity of examining the original gold plate, from which I find that our facsimile is not correct, inasmuch as it shews the tail of the *h* to be longer than it is in the original, where it is of the same relative size as in ordinary *hs*, only not quite as curved, the difference proceeding from a desire on the part of the engraver to avoid bringing it into contact with the right foot of the preceding letter.

the verb; it is distinctly *vihayati; vi* prefix *ti* the conjugational termination, and *haya* the root. In Wilson's Dictionary, this root is said to have four meanings "to move," "to worship," "to sound," "to be weary," but none of them seems to be appropriate. "To move" might be used in the sense of "to pass away." But a Buddhist would not in a hurry say of his saint that "he passed away." The more probable reading therefore appears to be *viharati*, a genuine Buddhist term for "taking pleasure" or "relaxation." To do this, however, the *ya* must be assumed to be a miscript for *ra*. But whether so assumed or not, the word must be taken as a metaphorical expression for death.

My reading of the entire inscription according to the above analyses would be शिरए भगव चोघचोप्राज्ञ रातियामउ हसिसपिउ हससिल्लु द्वससो ञतियोह विहरति ॥ and its translation: "In the first watch of the night, Bhagavan Bodhaboprájña or Bodhaboprávva, the joyous, for the sake of prosperity, drinking of joy, and rising above his flock, took his relaxation."

One objection to this reading of the text, though not a serious one, is its style which is much more artistic and high flown than would be suited to a Bactro-Buddhist epitaph; but if the value assigned to the several letters composing it be admitted, the meaning cannot well be avoided. The only Arian records of any length that have yet been translated are the As'oka edicts of Kapur-di-giri and the Vase inscription from Wardak, and they are both, in nearly pure Páli. If they differ, the difference is due to their bearing a closer resemblance to the Sanskrit than to the Páli, and not to any deterioration from the Páli. Following the former, they retain the three sibilants and compound consonants with *r*, which are nowhere met with in the latter. The Arian legends on the bilingual Bactrian coins are likweise in Páli, and they fully justify the assumption that in the time of the Indo-Bactrian sovereigns the language of court and religion was the Páli, and since the inscription under notice is unmistakeably a Bactrian sepulchral record its language must be the same; which being conceded, the meaning I have given to it follows as a matter of course. I have found that it is possible by a segregation and rearrangement of the different syllables—the words being engraved continuously in the original and not separated—to form new words with different meanings, but as they could not be held together by any grammatical cement, I have not thought proper to advert to them

here. I feel that my reading does some violence to two or three letters by assuming misscripts and mislections, but as it abides strictly by a language and a grammar, I trust it will be deemed preferable to any attempt at decypherment on my part which for the sake of a fancied fidelity to a few letters—and those of forms so dubious that they may be mistaken for several others and engraved at a time when the art of engraving was in its most primitive state,—would cast overboard all considerations of the laws of language.

The plate annexed to this paper, has impressions of six ancient gems now in the possession of Mr. E. C. Bayley, and of a Cufic seal in the cabinet of the Society. The gems were subjected to the examination of the learned scholar Dr. Martin Haug of Poonah, whose readings of the legends of five of them are here annexed.

"Fig. 1 represents the head of a Roman, the inscription in Sassa-
"nian Pehlevi can be read only as Calmilos. He was very likely in
"the service of one of the Sassanian kings, for we find in the British
"Museum a Daric, with the Greek inscription Pythagoras.

"Fig. 2 Sassanian Pehlevi Shahipuhri Mazd (ayasn) i. e. Shahpoor
"the Zoroastrian.

"Fig. 3 represented a cypress; the inscription is in Hebrew cha-
"racter, the language late Hebrew approaching Chaldaic, *Ab Habbaroth*
"Hab baruth, the name means owner of a Cypress אב *ab* means father,
"owner, and ברת Baroth is the Chaldaic form for Barosh cypress : ה
"*ha* before Baroth is the Hebrew article, not admissible in Chaldaic.
"As to the name, compare the name of the celebrated Babylonian
"historian Berosus.

"Fig. 4 contains very likely inscriptions in two languages, or, bet-
"ter, is the two dialects of Sassanian Pehlevi known from inscriptions.
"The upper inscription is in a kind of Hebrew character (used by the
"Sassanians) and contains evidently the name Damask. The inscrip-
"tion below bears some resemblance to old Armenian characters, but
"I cannot yet read them with certainty.

"Fig. 5 Sassanian Pehlevi inscription Baba i. e. Ktesiphon (occur-
"ing often in coins)."

Fig. 6 has not yet been read.

The Cufic seal (Fig. 7) was purchased from one Chanda Mull of Peshawar, a coin-dealer. Its substance is jet well polished, and the letters most beautifully engraved. The legend records the name of Isamel, son of Hamad.

Remarks on the above by E C. Bayley, Esq., C. S.

As the relic with which the above note deals has also been for some time before myself, and as the conclusions to which I have come do not altogether, even as to the phonetic values of the letters of the inscription, concur with those above given, I presume to offer a few remarks.

I would venture in the first place, with all deference, distinctly to join issue with Babu Rajendra Lal as to the language proper of the Ariano-Pali inscriptions. To give the position which he assumes in his own words I quote from p. 182:—"The only Arian records of any length that have yet been translated are the A'soka edicts of Kapur di giri and the vase inscription from Wardak, and they are both in nearly pure Pali. If they differ at all, the difference is due to their bearing a closer resemblance to the Sanscrit than Pali."

If this assertion were even to its fullest extent accurate, I would point out in the first place, that the first example quoted gives no support whatever to the conclusion deduced from it. The language of the Asoka inscription was the language of Asoka—whose capital was in Behar. It was probably issued as a quasi religious edict even, and may have therefore rather adopted a sacred dialect than the current vernacular of that province, but even if it were not so, it proves little or nothing as to the vernacular of the countries North of the Jhelum. Asoka would, in a document of the nature of that he was promulgating, adopt naturally the alphabet, but not the dialect of the locality, except perhaps in some very minor particulars.

As to the Wardak inscription, it must be remembered that in the first place *a very considerable proportion has even yet not been translated at all.* Much of this is, so far as the characters go, legible enough; for there is no dispute as to the phonetic value of the letters. Had they been capable of transmutation into "pure Pali" I am certain that they would hardly have so baffled Rajendra Lal himself; who would long since in such a case have solved the enigma of their meaning.

Even in the parts which he has rendered into English, there are some phrases which are hardly to be taken as "pure Pali" without a straining of the phonetic value of the letters, which, to say the least, is of doubtful admissibility; but passing over this point, there

are yet words which, accepted even in the sense which he has taken, are certainly not pure Pali nor pure Sanscrit:—for example, the word "Mahi Sachya" or "Mahi Sachha" in the 2nd and 3rd lines. The form of the demonstrative pronoun "iya" and "imena" approaches too more nearly to the form prevailing in the Perso-Pali of the Behistun inscription than to the Indo-Pali or Sanscrit. The proper names which occur in the Wardak inscription, moreover, are most of them certainly in no degree of a Sanscrit or Pali origin.

While therefore fully admitting that *a* dialect of Pali forms the groundwork of the language of the ordinary Ariano Pali inscriptions, I would venture to demur to the assertion, that it differs only from the ordinary Pali of India in "bearing a closer resemblance to the Sanscrit."

The arguments adduced in support of this assertion have at least failed to prove it, and I may venture the rather to doubt its soundness, as I know that on a careful examination of the Wardak inscription, shortly before his death, the late Professor H. H. Wilson expressed a very opposite opinion.

Indeed the antecedent circumstances of the case are very much against the probability of the language, at least of any territories north of the Jhelum, being purely Pali, or Sanscritized Pali.

Whatever the predominating element of the population may have been, it certainly was *not* a purely Hindu population at any time between 300 B. C. and 200 A. D.,—the period to which most of the inscriptions which have come down to us, may be pretty safely assigned. The Bactrian branch of the great Arian family, to which most, if not all, of its subdivisions using the Semitic alphabets may with some likelihood be attributed, leaned in their dialect, according to Professor Haug, rather to that used by their Persian, than to that of their Indian brethren.

But what is of far more importance, during the five centuries named, and very probably for many others antecedently, these provinces had been the highway by which hordes of invaders of every class and stock had poured themselves upon India.

Many of these were unquestionably of a Turanian stock, and it is probable that of each successive army some portion settled itself on the soil by the way. The only wonder is, that the Arian element retained even so strong a position in the language as it evident-

ly did, and sufficient vitality to assert its supremacy and community with the Hindu element, as the facts of subsequent history so far as ascertainable would indicate. Albeit to this day many of the wild tribes (e. g. the Ghukkurs) who people the country even south of the Indus, can scarcely be considered as having ever fairly belonged to the Hindu race.

That a foreign element was strong in the trans-Jhelum districts at the period of which I have spoken, may be guessed from the familiar names of men and places, which are certainly for the most part anything but Pali or Hindu. These are indications of the tendency of the daily life of the races for whom the inscriptions were written, and I think that it may be fairly from them assumed, that the language of their common use must be, primâ facie, expected to partake of a similar character.

It is not therefore too much to say that in these regions at least (and perhaps this is true also to some degree and at some time of other parts of India) we should not *expect* the language of an inscription of the period to which we refer to be either pure Pali or Sanscritized Pali; and a version which renders it as such is, I think, therefore ipso facto open to doubt and suspicion. Of course under such circumstances more than ordinary jealousy and circumspection is necessary in "stretching" the phonetic value of any letter, to suit an intelligible reading.

Having said so much on this point, I wish to notice another preliminary objection to Rajendra Lal's version, which is the somewhat high flown character of the language as given by him. It is opposed to that which, as far as other inscriptions of the same period go to show, was employed at that time and in similar inscriptions. True, as Rajendra Lal has pointed out (in page 182) this argument is of little value if the reading of the inscription is in itself unimpeachable, but where, as here, that is *not* the case, it is an argument which goes some way to overthrow the probability that the version given *is* the correct one.

I am now bound to give the transliteration of the inscription, which appears to me to be correct, and having done this I will attempt to give a conjectural reading, open I am aware to very considerable doubt, but which still seems to me preferable to that above offered.

Before doing so I would observe that the phonetic value of but

three* letters, viz., the 11th of the first line and the ninth and tenth of the second line, appears to me open to any doubt. I would also add that as I read the original sealing wax impressions, the 12th letter of the first line has the vowel mark of "e" which the plate as published does *not* give.

Of the three doubtful letters Babu Rajendra Lal would wish to read the first as "jna." There is here even not only no *authority* for this reading, but a direct authority against it; "jna" occurs, as Rajendra Lal himself has pointed out, on the biliteral coins of Kanunda in a form which by no possibility can have been corrupted or converted into that here used. I am free to admit that there is no distinct example, so far as I am aware, of the character here employed, elsewhere—but it is in itself nothing more than a couple of "v" s placed the one above the other—the compound of two "v" s is not an uncommon one, and though probably such compound letters were not known to the earlier Pali, there is, I think, some ground for believing that they were gradually introduced into it. The compound of "s," "t" and "r," of "t" and "r," of "s" and "p," of "j" and "n" have been fully recognized and established by bi-literal inscriptions. There is, therefore, no antecedent improbability against the reception of the compound, and I believe that most of the characters in those inscriptions which are yet undetermined, are probably also compound.

The second doubtful letter, the twelfth of the second line, I agree with Rajendra Lal in rendering as "lu" or better perhaps "lo," but the shape of the vowel mark makes the reading a little uncertain. The 13th letter is too in all probability a vowel, but I think rather "ó," or perhaps "ú," than "i," as was rendered in the note above.

I may also point out that the 14th letter may possibly be either an "r" or a "t;" it certainly is not a "v" as rendered by Rajendra Lal, and all the other letters in the reading by which I differ from him may be seen at once by the parallel transliterations given below.

Babu Rajendra Lal's

"Sirie bhagava bodhavo prajna"
"Ratiyámaṭu† hasisapiṭa ha-asilu"
"iva sasi atiyoha viharati."

* Since writing the above I have had an opportunity of examining the original gold leaf: the ninth letter may *possibly* be read as "ye."

† The plate given omits the vowel mark which is that of the vowel "e."

My reading after the three first words differs materially, as will be at once apparent.

Sirae Bhagava Bodhabo prevvavétiye
yè
matuha sisa pituha sasé
loota sasi atiyo hratchajati

As to the tentative reading which I am about to offer, it is necessary to say, that of four words it is very nearly, if not altogether, conjectural, of these three are the words "sisa," "sase," "sasi." It may perhaps be a bold guess and one which I confess is mainly founded on the context, but it is one which I nevertheless venture to offer, that these words are forms of one and the same word, and I further guess, that they represent the adverb "from," modified in concordance with the number and gender of the word to which they are attached as with us is the case with the modern well known "ka, ki ke,"of theHindustani genitive—originally also probably a similar quasi adverbial post position. If this conjecture be admissible, perhaps the form now found may be the ancient elaborate form of the modern Hindustani "sé." I put forward this guess with great diffidence, but it may be worth at least examination before it is repudiated.

The fourth word "loora," or better "loota," is one to which I can find no fair analogue. Col. Cunningham indeed informs me that he has met with the word "lüira" in some of the local Hill dialects as the equivalent of "children;" this expression would accord better with Rajendra Lal's rendering of the vowels than with my own; but at any rate if my general rendering of the inscription be correct, the word, whatever its exact form, must express some degree of kindred, specific or general.

My own version, I may state, accords generally with one which Col. Cunningham long since communicated to me, and on that account perhaps I have the rather inclined to put it forward, side by side with that of so distinguished a scholar as Rajendra Lal.

To begin with, I take the first fourteen letters to form two words only; the first, as suggested by Babu Rajendra Lal, an inflected form

of the word "sri," the latter a compound word containing as its first members the words "Bhagava Bodha" and inflected in concordance with "siräe." It is I believe composed of three or more words, the latter being the word "atiya" which I take to the Bactro Pali form of the Sanscrit atyaya (अत्यय = Death—) which word as I read it, occurs again towards the close of the 2nd line of the inscription.

The whole I take to be an invocation to Budha as a protector from calamity; the centre words may perhaps be some derivative of पॄ to protect. I cannot, however, pretend to set forth more than the general sense as above given, say "To Bhagava Budha, the protector from calamity."

The remainder of the inscription then goes on to enumerate, as I understand it, the members of the writer's family as "matuha sisa pituhasase," "luota sasi," "from my mother," "from my father," "from my children?" and to conclude with a prayer, "atiyo hratehajati" may calamity "be conveyed away" or "be averted."

The addition of a vowel like "u" to the words "pita" and "mata" is I should suppose a dialectic peculiarity. Similar changes occur everywhere in local dialects all over India, the syllable "ha" may possibly be a mere inflection (Conf. Lassen Prakrit Grammar, p. 399, on the Saurasenic dialect).

Or it is possible that "matuha," "pituha" may be generalizations and mean maternal and paternal relatives; as to "luota" I have already explained that its exact meaning is quite uncertain, and "atiya"* as the supposed equivalent of the Sanscrit "atyaya." The verb I read as "hratèhajati" and would render as in the imperative or optative tenses of the passive voice of the root हृ "let it (atyaya) be conveyed away," or, "may it be conveyed away."

That this rendering is in a great measure conjectural, has been already said, and it is professedly put forward as such, and to invite criticism and correction. I would only add that in its general character, that of an invocation for the bestowing of blessings on, or the removal of evils from, friends and relatives, it accords with what appears to be the undoubted general purport of the

* It occurs also in that part of the third line of the Wardak inscription which Rajendra Lal has left untranslated.

"Wardak" inscription, and with what seems to be the purport of the unfortunately imperfect inscription sent by Major Pearse from Eusofzye, in which the words "mata, pita" occur in conjunction.

The inscription from Bimaran, (see Thomas's Prinsep's essays, Vol. I. Pl. VI. and p. 105) is also a dedication of a reliquary for the prosperity (pusae) of "Sri véchitra - - - dhatra putra," probably one at least of Col. Cunningham's Eusofzye inscriptions has a similar meaning.

The conjectural reading, therefore, which I have ventured to submit of the present inscription, has so far additional probability, that its general object and purport is that which seems the most common in inscriptions of the same class and period.

Correspondence.

Extracts from a Letter from Sir Robert H. Schomburgk, *British Consul at Bangkok, to Mr.* Blyth; *latest Date, Bangkok, May 20th*, 1862.

(Various extracts from this and previous letters from Sir R. H. Schomburgk to Mr. Blyth, on Natural History topics, have been incorporated by our Curator in Reports which are still awaiting publication; and both from the present letter, and from one subsequently received from Mr. W. T. Blanford by Mr. Blyth, extracts relating to the Rhinoceroses of the Indo-Chinese region are given in p. 168 *antea*.)

Sir R. H. Schomburgk writes, from the capital of Siam:—

"I made a short excursion in the commencement of last April. Since my return from Moulmein in April, 1860, I had not been absent from Bangkok a single day. My old enemy, rheumatism, plagued me sadly; and the Doctor advised a trip. I resolved to visit Prabat, from which place, according to the Siamese legend, Buddha stepped over to Adam's Peak in Ceylon, leaving his foot-mark in Prabat, and impressing the print of his other foot on stepping on the Peak. Prabat is, at certain times of the year, a much frequented place of pilgrimage, which the king himself visits almost annually in great state. A gorgeous temple has been erected over the so-called foot-print, (which is in limestone—a coarse blue marble,) according to which Gaudama or Buddha must have had astoundingly large organs for ambulation. According to a fac-simile, hung against the walls of the temple (for the sacred foot-print is covered with a grating and strewed with rings and other trinkets of value), his foot measured 5½ ft. and where broadest 1 ft. 10½ in.

"I proceeded from thence to Nookburi, an ancient residence of the Siamese kings; of the former splendour of which the Ambassadors of Louis XIV, have told us so much; but that is all gone. (*Par parenthése*, the present king is there erecting a residence; but how inferior to what those old ruins indicate the palace must have been when in its pristine beauty!) The ruins of the house of that Greek adventurer, Faulcon, interested me much—at one time only

second to the king, he ended his career by being cruelly murdered, his patron tacitly consenting.

"I now hurried home. The cremation of the Queen Consort, who died on the 9th of September, was to take place on the 18th of April. The solemnities and ceremonies had already commenced a week previously. The king himself lit the pile—the Governors of nearly all the provinces were present, and the crowd assembled was from 15,000 to 16,000 persons—if not more. The king has since made a pilgrimage to Pechaburi to visit the cave, and he has returned. I presume we shall now fall back to our every-day life.

* * * * *

"You have perhaps seen already in the papers a notice of the death of M. Mahout, a zealous collector of objects of Natural History, combining with it scientific knowledge. He was a Frenchman by birth, but English naturalists and friends of the science sent him to make collections in Siam, Cambodia, Tonquin, &c.: at the limits of the latter, he fell a victim to jungle-fever. His collections have been brought safely to Bangkok, and forwarded to London. His discoveries were principally grand in serpents, shells, and insects; and you must have frequently seen notices in the 'Proceedings of the Zoological Society,' &c., of what he found.

"My brother Richard, who accompanied me during the latter part of my Guiána travels, on account of the Prussian Government, and who is now settled in S. Australia, near Adelaide, has given rather an interesting account of Gould's *Leipoa ocellata*. Richard purposes to undertake a journey to the Murray district:—farming affairs, it seems, as with the majority of persons once initiated in the life of travelling in the bush, do not agree with him,—nor do they succeed in agricultural pursuits. He writes to me that during the last six months, taking only each Saturday for such a purpose, he has collected about 100 birds, 70 *Amphibia*, and 40 species of fishes. As far as I understand, from his letter, he labours for the museum at Berlin, and has the patronage of the Professors of Natural History there.

* * * * *

"That bird so interesting to me, the *Diardigallus Crawfurdii*,* seems to belong to the Shan States. One of the Governors of those

* *D. prælatus*, Pr. Bonap.; *D. fasciolatus*, Bl., *J. A. S. XXVII*, 280.

provinces, tributary to Siam, who had been summoned on Government business to Bangkok, declared it to be a bird belonging to his district. He likewise declared that another bird, sold to me as the female, smaller in size with brown plumage, to be really the female; though the size and colour of the two are entirely different. As regards manners, however, and the peculiar cry of recognition when a person whom they know is approaching, or is to give them food, these are entirely similar. M. von Martens, the naturalist of the Prussian expedition under Count Eulanburg, was of opinion that the bird in question was the female of *D. Crawfurdii*. Still I should be glad to obtain other proofs. If this bird belongs to the northern (or rather eastern) Shan States, you, through Major Tickell or some other friend at Moulmein, will be able to procure further information. At Major Tickell's house I saw a living specimen of the bird; but the Major was absent during my visit."

Extract from a letter from W. T. Blanford, *Esq. (written on his voyage to Suez) to Mr.* Blyth; *dated from Galle, May 30th*, 1862.

"I promised, if I could, to write you a few notes about the distribution of the Burmese animals, on my way from Calcutta to Galle. I now hurriedly jot down the more important points which struck me.

"You know that Lower Pegu is distinguished from Upper Burmá, as regards climate, pretty much as Lower Bengal differs from the Upper Gangetic plains; but in a much greater degree: Pegu being damper than Bengal; Upper Burmá dryer than the N. W. provinces. The great change takes place above our territories, and is most strongly marked after passing Mendha. But a very considerable alteration in the vegetation, and a corresponding one in the Fauna, take place at a much lower point, and are perhaps first to be noticed about Akouk-toung, a rocky promontory on the banks of the Irawádi about 30 miles below Prome. A comparatively dry region, however, stretches down the eastern flank of the Arakan hills, so far as they form a high connected range, that is—to a little below the parallel of Henzada; and of this the Fauna of the range of hills stretching to Cape Negrais is, in its principal features, essentially Arakanese, the hills being covered with dark evergreen jungle. My experience of both regions is mainly confined to the west side of the Irawádi river.

"Of the upper dry region, the most characteristic animal is perhaps a ground Thrush (*Chatarrhæa gularis*, Blyth). I have never met with this bird below Prome; nor have I ever seen it in thick or high jungle. It is entirely an inhabitant of bushes. It is common at Thayet Myo; and higher up, about Yenán-phyoung and Pugan, it far exceeds any other bird in its numbers. Your *Lepus peguensis* is also, so far as I know, confined to this dry region;* as are also the few Jackals which occur in Burmá. I have not heard of them, however, above the frontier; but suspect they will be found there, as well as at Meaday and Prome.

"Dr. Jerdon's new species of Magpie (*Crypsirina cucullata*), and his new *Pericrocotus*,† and probably his new Mainas,‡ are other species peculiar to the dry region; none of them appearing to occur below: your *Urocissa magnirostris* I met with, near the base of the Arakan hills, as far south as the neighbourhood of Gnathem-phyoung, but no further.

"Of the damper climate of Lower Pegu, one of the most typical birds, so far at least as abundance is concerned, is the large *Buceros plicatus* (your *ruficollis*, the species with deep notches on the sides of the bill,) of Arakan.§ *Sciurus Keraudrenii* I have seen near Myansoing; but it is far more common to the south; where, also, a peculiar variety of *Sc. bicolor*, with a light patch or band on the back, is tolerably abundant. If *Sc. bicolor* exists in Upper Burmá, it must be excessively scarce.‖ *Sc. assamensis (?)* is common throughout the Bassein district; and another species (*Sc.*—?) is said to occur above; but of this I am far from certain.

* I was assured of the existence of Hares on the left bank of the Salween, above the junction of the Yunzalin river.—*Cur. As. Soc.*

† *P. albifrons*, Jerdon, *Ibis*, 1860.

‡ Major Tickell called my attention to a white-headed Maina, which, he remarked, he had only seen about Rangoon, where I sought for it in vain. It is doubtless the *Temenuchus burmesianus*, Jerdon (*loc. cit.*), obtained by him at Thayet Myo, and by Mr. Blanford in various parts of Upper Burmá. I observed, however, in Col. Phayre's compound in Rangoon, a flock of the beautiful *Ploceus hypoxanthus*, (Daudin); Dr. Jerdon obtained this bird at Thayet Myo; and Sir R. H. Schomburgk in Siam (*P. Z. S.* 1859, p. 151): it having previously been only known from Jáva and other islands of the great Eastern archipelago.—*Cur. As. Soc.*

§ The most characteristic bird of the Martaban and Tenasserim jungles is certainly *Garrulax Belangeri*, at all elevations. The Shama (*Kittacincla macroura*) is also very abundant.—*Cur. As. Soc.*

‖ It is not likely to occur in Upper Burmá, to judge from the analogy of *Sc. purpureus* of Central India, the range of which does not extend to Upper Hindustán.—*Cur. As. Soc.*

"I pointed out to you when in Calcutta the distinction between the three Kingfishers of salt-water and those of fresh-water streams and pools.*

"The Irawádi Porpoise abounds in many parts of the river. I saw them in great numbers above Ava in the gorge below Malé, and from their extreme scarcity in Pegu during the rains, I think it by no means improbable that they migrate up the river at that season. I believe something similar has been observed in respect to the 'Susu' of the Ganges.†

* * * * *

"Of the new birds in my collection, the Maina (*Temenuchus burmesianus*, Jerdon,) is from Thayet Myo, and will doubtless prove another of the peculiar species of the dry region. The little black and white bird (*Rhodophila melanoleuca*, Jerdon,) is from the same place. Of *Mulleripicus Heddeni*, I believe that I obtained one specimen at Thayet Myo, and subsequently I again shot it S. of Bassein. It is a very wary bird. The rare Bunting (*Emberiza rutila*, Pallas,) I found in grass on a stream, at the base of the Arakan hills near Gnathim-phyoung. The *Rhodophila* was shot in elephant-grass in the plains near Henzada.

"That is all I can think of at the moment. Of course you may insert in any way you please. The land mollusks fully bear out the separation of the two provinces, Arakan and Lower Pegu from the Upper Irawádi valley. Scarcely a species is common to the two regions."‡

* *Halcyon amauropterus*, *H. atricapillus*, and *Alcedo meningting*, being the salt-water species noticed by Mr. Blanford, which are replaced higher up the rivers by *H. leucocephalus*, *H. fuscus*, and *A. bengalensis*. The little *Ceyx*, also, appears to be peculiar to brackish water; but I observed *H. atricapillus* about 100 miles up the river Salween.—*Cur. As. Soc.*

† The 'Porpoise' of the Irawádi has not yet been scientifically examined.—*Cur. As. Soc.*

‡ Here I may remark, that the zoology of the more distant (and more recently acquired) dry region of the Upper Irawádi has hardly, as yet, been more than commenced upon. Though I collected pretty largely both at Moulmein and in Upper Martaban, I obtained no new species of bird whatever; and only one dubiously new mammal (a *Rhizomys*) in the latter region. The same number of species collected in Upper Pegu would, doubtless, have yielded at least several novelties; and it was there that Dr. Jerdon and Mr. Blanford discovered their various new birds. I was successful, however, in procuring capital specimens of sundry desiderata.—*Cur. As. Soc.*

A further Note on Elephants and Rhinoceroses.

There is a notice of the wild Elephants of Borneo in Mr. Spencer St. John's 'Life in the Forests of the Far East' (1862), I, 95. This author writes—"Among our Malays was one who had frequently traded with the north-east coast [of Borneo], and the mention of *gading* (ivory) brought to his recollection that Elephants exist in the districts about the river Kina Batañgan. I have seen many tusks brought to Labuan for sale, but never measured one longer than six feet two inches, including the part set in the head.

"I have met dozens of men who have seen the Elephant there, but my own experience has been limited to finding their traces near the sea-beach. It is generally believed that above a hundred years ago the East India Company sent to the Sultan of Sulu a present of these animals; that the Sultan said, these great creatures would certainly eat up the whole produce of his little island, and asked the donors to land them at Cape Unsang, on the north-east coast of Borneo, where his people would take care of them. But it is contrary to their nature to take care of any animal that requires much trouble, so the Elephants sought their own food in the woods, and soon became wild.

"Hundreds now wander about, and constantly break into the plantations, doing much damage; but the natives sally out with huge flaming torches, and drive the startled beasts back to the woods.

"The ivory of Bornean commeree is generally produeed from the dead bodies found in the forests; but there is, now living, one man who derives a profitable trade in fresh ivory. He sallies out on dark nights, with simply a waist-cloth and a short, sharp spear: he crawls up to a herd of Elephants, and, selecting a large one, drives his spear into the animal's belly. In a moment, the whole herd is on the move, frightened by the bellowing of their wounded companion, who rushes to and fro, until the panic spreads, and they tear headlong through the jungle, crushing before them all the smaller vegetation. The hunter's peril at that moment is great, but fortune has favoured him yet, as he has eseaped being trampled to death.

"In the morning he follows the traces of the herd, and, carefully examining the soil, deteets the spots of blood that have fallen from

the wounded Elephant. He often finds him, so weakened by loss of blood as to be unable to keep up with the rest of the herd, and a new wound is soon inflicted. Patiently pursuing this practice, the hunter has secured many of these princes of the forest."

In another place (I, 396), but again with reference to the valley of the Kina Batañgan river, Mr. St. John remarks—"As this is the only country in Borneo where the Elephants are numerous, it is the only one where ivory forms an important article of trade in the eyes of the natives."

Now, I am well aware of Mr. Darwin's calculation as to what the accumulated progeny of one pair of slow-breeding Elephants might amount to, in the course of five centuries, supposing that naught happened to check their increase in the geometrical ratio; but I doubt exceedingly that, in the instance under consideration, the existing great herds of Elephants in the N. E. peninsula of Borneo have descended from some two or three individuals put ashore by the order of the Sultan of Sulu, a little more than a century ago; continually decimated, too, as these Elephants would seem to have been and are at this time: and I doubt it all the more, because it appears that wild herds of Elephants existed until recently in Sulu! Why, therefore, should the few tame Elephants presented to the Sultan of Sulu be landed in Borneo? The remnant of the wild race existed in Sulu within the memory of people now living! On this subject, Mr. St. John fortunately helps us with information. In his notice of Sulu, he remarks (II, 243),—"Remembering Forest's statement that Elephants were found in his time in the forests which clothed so much of the soil of the island, I asked Dater Daniel about it; his answer was, that even within the remembrance of the oldest men then alive, there were still a few Elephants left in the woods, but that, finding they committed so much damage to the plantations, the villagers had combined and hunted the beasts till they were all killed: I was pleased to find the old traveller's account confirmed." II, 243.*

* Unfortunately, Mr. St. John is no naturalist. The little 'Mouse Deer' he calls the 'Moose Deer' (II, 52), like some of our countrymen in Ceylon; thus confounding the very smallest of the Deer tribe with the very largest; and the tiny animal of the tropics with the giant of northern regions! Of his two kinds of horned Deer (I, 33), I take the *Rusa Balum* to be the Javanese Rusa, and the *Rusa Lalang* to mean the Muntjac. The latter, however, is elsewhere

Why should the Elephant of Borneo have been introduced by human agency, any more than the RHINOCEROS SONDAICUS, or the BOS SONDAICUS; which latter would appear to be remarkably numerous on the vast island?

I have been assured that there is no notice of the Rhinoceros in the early Sanscrit writings; but then the river Ganges is mentioned once only in the whole course of the Vedas. Questioning Mr. E. B. Cowell on the subject, he obligingly writes word—"There are at least two Sanscrit words for Rhinoceros, *Khadga* or *Khadgin* (*Khadga* properly means 'a sword'—then the horn, and lastly the animal, —*Khadgin* means the 'sword-bearer,') and *Gandaka* (*ganda* properly means 'a cheek'). Both words are found in the *Amara Kosha* dictionary about 56 *B. C.*, and the words *Khadgin* and *Khadga* occur in the *Mahábhárata* and *Rámáyana*. The Hindustani word is *Gaindá;* and I suspect Báber used this term, as all our Indo-Persian writers use Hindustáni terms pretty freely. There is, however, a good Persian word for it, *Karkadan;* and I find in Richardson's dictionary a new fact in Natural History which I doubt if even you have found out. I transcribe his whole account.

"'The horn of this animal, it is said, sweats on the approach of any species of poison, for which reason many Eastern princes make use of it constantly at table; when split through the middle there is the resemblance of a man represented by white lines, together with the figures of several birds.'

"There are several Arabic names for the Rhinoceros, as *Mirmís*, *Hirmís*, *Karkaddan;* but these names tell nothing." The Arabs, however, most probably obtained their knowledge of the genus from one or more of the African species. *Gondá* is the name applied in Bengal (misspelt *Gomdá* in Parsons's paper in the *Phil. Trans.)*, passing into *Gorrá* in Upper Hindustân: *Kyen* or *Kyeng* is the Burmese name; and *Bádák* or *Bodok* the Malayan. *Gondá* has at least the merit of brevity over *Rhinoceros*, and is quite as *euphonous*.

With respect to the history of the skeleton of RH. SONDAICUS in the Society's museum, *vide J. A. S.* III, 142, IX, 518, X, 928. The

mentioned by him by its name of *Kijang*. So familiar a bird (in museums at least) as a Trogon, he does not know by that name, but terms it the 'Omen-bird' (II, 62, 67, 95); and the remarkable wild Boar of Borneo (SUS BARBATUS) he fails to recognise as a peculiar species. The BOS SONDAICUS would appear to be very common in the part of Borneo traversed by Mr. St. John, and he designates it by the name *Tambadau*.

animal was shot by Sir J. Barlow, Bt., (then Mr. Barlow,) in the Jessore district, and his people brought the carcass to Calcutta by Tolly's nullá. It was conveyed to the Mint, and was there prepared as a skeleton by Mr. W. E. Templeton (subsequently employed as a taxidermist by the Society) for the late James Prinsep, who afterwards presented it in the name of Mr. Barlow for the Society's museum.*

Báber's account of the Rhinoceros, as given in Mr. Erskine's translation, is as follows :—

In his notice of the "animals peculiar to Hindustân, after describing the Elephant, he remarks—

"The Rhinoceros is another. This also is a huge animal. Its bulk is equal to that of three Buffaloes. The opinion prevalent in our countries, that a Rhinoceros can lift an Elephant on its horn, is probably a mistake. It has a single horn over its nose, upwards of a span in length; but I never saw one of two spans. Out of one of the largest of these horns I had a drinking-vessel made and a dice-box, and about three or four fingers' bulk of it might be left. Its hide is very thick. If it be shot at with a powerful bow, drawn up to the arm-pit with much force, and if the arrow pierces at all, it enters only three or four fingers' breadth. They say, however, that there are parts of his skin that may be pierced and the arrows enter deep. On the sides of its two shoulder-blades, and of its two thighs, are folds that hang loose, and appear at a distance like cloth-housings dangling over it. It bears more resemblance to the Horse than to any other animal. As the Horse has a large stomach, so has this:† as the pastern of a Horse is composed of a single bone, so also is that of the Rhinoceros. It is more ferocious than the Elephant, and cannot be rendered so tame or obedient. There are numbers of them in the jungles of Peshâwer and Hashnaghar, as well as between the river Sind and Behreh in the jungles. In Hindustân, too, they abound on the banks of the river Sirwû. In the course of my expeditions into Hindustân, in the jungles of Peshâwer and Hashnaghar, I frequently killed the Rhinoceros. It strikes powerfully with its horn, with which, in the course of these hunts, many men, and many horses,

* I find that, in the Catalogue of the mammalia in the India House Museum (p. 195), the *habitat* of Rh. sondaicus is set down as "Java exclusively!"

† Linnæus remarks—"*Viscera ad equina accedunt.*"

were gored. In one hunt, it tossed with its horn, a full spear's length, the horse of a young man named Maksûd, whence he got the name of Rhinoceros Maksûd."*

Again, in the course of his narrative, he states—

"We continued our march till we came near Bekrâm and then halted. Next morning we continued halting in the same station, and I went out to hunt the Rhinoceros.

"We crossed the Siâh-Ab, in front of Bekrâm, and formed our ring lower down the river. When we had gone a short way, a man came after us with notice, that a Rhinoceros had entered a little wood near Bekrâm, and that they had surrounded the wood, and were waiting for us. We immediately proceeded towards the wood at full gallop, and cast a ring round it. Instantly on our raising the shout, the Rhinoceros issued out into the plain, and took to flight. Hûmâiûn, and those who had come from the same quarter, never having seen a Rhinoceros before, were greatly amused. They followed it for nearly a kos, shot many arrows at it, and finally brought it down. This Rhinoceros did not make a good set at any person, or any horse. They afterwards killed another Rhinoceros. I had often amused myself with conjecturing how an Elephant and Rhinoceros would behave if brought to face each other; on this occasion the elephant-keepers brought out the Elephants, so that one Elephant fell right in with the Rhinoceros. As soon as the elephant-drivers put their beasts in motion, the Rhinoceros would not come up, but immediately ran off in another direction."

The description which Bâber gives of a mailed single-horned Rhinoceros is unmistakeable; but it still seems passing strange that these huge *pachyderms* should have been killed with arrows.

E. Blyth.

* Some of Bâber's observations are amusingly correct. Thus, of the common large Indian Frogs (Rana tigrina), he remarks—"The Frogs of Hindustân are worthy of notice. Though of the same species as [*i. e.* akin to] our own, yet they will run six or seven *guz* [twelve or fourteen feet] on the face of the water." I have known more than one European naturalist-traveller to have been at once struck with this peculiarity.

Literary Intelligence.

The following extract on the geographical knowledge of the nations of Islám, is from a letter received by Babu Rajendralal Mitra from Professor Rafn of Copenhagen.

"*The Royal Society of Northern Antiquaries* in Copenhagen has published a new volume of its Annals of Northern Archæology and History. This volume for 1857 opens with a voluminous and instructive historical and geographical enquiry by A. F. Mehren 'on the general geographical knowledge possessed by the Islamitic nations, particularly with respect to the northern and southern coasts of the hemisphere known to them.'

"The distinguished French Professor Reinaud, and the illustrious geographers Malte Brun and Lelewel have particularly directed our attention to the merits of the Arabs in geographical study. The present treatise is a continuation of the labours of these and other scholars.

"We have first a critical sketch of the most important Mohammedan Geographers from the 8th to the 16th century according to our era. We have next separate chapters on the oldest unscientific ideas of the Arabians on the Universe, their conceptions of the form of the earth, their mathematical division of the earth, their measurement of the degrees, and the division of the habitable globe into seven regions or climates. Another chapter treats at length of the terrestrial system of seas, the limitation of the earth by the ocean and the parts of the latter: the Southern Ocean with its coasts and islands, and the several seas connected therewith, the Eastern Ocean, the Western Ocean and its connected seas, the Mediterranean with the Black Sea and the Caspian, the isles in the Western Ocean and the coasts of the same, the Northern lands, known to the Arabs, surrounding the Varenger Sea.

"Among the many local names here mentioned as occurring in the works of the Arabian geographers, there is one of especial interest. It affords a supplement to Rafn's 'Antiquitates Americanæ' published by the Society in 1837. The result of the geographical inquiries in this work on the situation of the Northmen's Helluland (Newfoundland), Markland (Nova Scotia) and Vinland (New England) has

been taken up with full approval by Alexander Humboldt in his Kosmos. A more southern land the Northmen named Hvitramannaland (the land of the White Men) or Irland it Mikla (Great Ireland). This was supposed by Rafn to be North and South Carolina, Georgia and Florida. The oldest historian of Iceland, Are Frode, states that his stam-father Are Marson came to this land about the year 983, and was baptized there. This same land, Irland it Mikla, Irlandeh el Kabirah, is also mentioned by an Arabian geographer of the 12th century, *Abû-Abdallah Mohammed Edrisi*, who was born in Ceuta in 1099, and had studied in Cordova. He drew up his work at the desire of Roger II. King of Sicily (1130—1154.) The above geographical name as well as several other notices of the North, were doubtless derived by the Arabian author from his intercourse with the North men at the court of this sovereign in Palermo.

"It is most interesting to follow the often highly successful identification of the local names mentioned by the Arabian geographers, especially those of several islands in the Western Ocean, places in France and England, and also in Scandinavia, particularly Denmark, where Slesvig is mentioned in a curious manner, and also in Sweden. The same thing applies to Russia. An extract from a voyage in the 12th century (1132) by *Abû Abdallah Hamid* of Granada, gives an undoubted description of a Whale-fishery on the coast of the Arctic Ocean near the land Wisu. This, according to the admirable explanation of Frähn, is the tribe Wes, spoken of in the Russian Annals, north of Novgorod by the White Lake (Bielo Osero.")

The following is an extract from a letter to the President from Dr. Sprenger, dated June 30th.

"You are probably aware that Wöpke is going to publish the Táríkh al Hind of Byrúny, of which Reinaud has inserted some extracts in his work on India. It is a most extraordinary work and proves that the author had a complete knowledge of Sanscrit literature Wöpke is an excellent Mathematician, and a good Arabic Scholar, and he has made considerable progress in Sanscrit. He began the study of this language on purpose to master Byrúny. Wüstenfeld intends to bring out the great work of Yáqút (ياقوت) on geography."

Notices of Books connected with Sanskrit Literature.

The Kumára-Sambhava, eighth canto, with a commentary by Prema Chandra Tarkabágís'a. Calcutta, 1862.

It is generally believed that only seven cantos of the Kumára-Sambhava are extant, and some have said that Kálidása died before he finished the work. Few European scholars are aware that the whole of the work exists in seventeen adhyáyas,* but whether it really belongs to Kálidása or not is a question which remains for future criticism to determine. The Professor of Rhetoric in the Sanskrit College has just published an edition of the eighth canto, the first of these doubtful sections, and he promises in the preface, that, should his labour be approved, he will publish the remainder in the same manner.

The present canto describes the loves of S'iva and Párvatí, but in a manner which befits mortals alone; and hence perhaps the oblivion into which the poem has fallen, as it violates a direct canon of Hindu criticism.† Although, however, some of the opening verses, from their indelicacy, do not deserve to be published, this by no means applies to the greater part of the canto, which is chiefly occupied with a very full description of the phenomena of evening and moonlight on the Gandhamádana mountains. Many of the verses are very beautiful, and as they have never before been published, we add a few of those which seemed to us most worthy of being ascribed to Kálidása.

"See! the declining sun, as it hangs on the edge of the western quarter of the sky, seems to make with its long reflected beams a golden bridge across the lake."‡

* There is a MS. of it in the Sanskrit College Library, and Dr. Aufrecht gives an account of two MSS. in his Bodleian Catalogue. The last book ends with the destruction of the demon Táraka, as foreshadowed in the second book.

† This is probably alluded to in Sáhitya D. vii. p. 233; "*yathá vá kumára-sambhave, uttamadevatayoh párvatí parames'varayoh sambhogas'ringáravarṇa-nam. Idam pitroh sambhogavarṇanam ivátyantam anuchitam, ityáhuh.*"

‡ पश्य पश्चिमदिगन्तलम्बिना निर्मितं मितरुचा विवस्वता ।
दीर्घया प्रतिमया सरोऽम्भसां तापनीयमिव सेतुबन्धनं ॥

We might almost compare these lines with the well-known passage of Moore.

> "And as I watch the line of light that plays
> Far o'er the hushed wave toward the gleaming west,
> I long to tread that golden path of rays
> And think 'twill lead to some bright isle of rest."

"Yonder setting sun, bearing the day with him, plunges into the ocean, and the horses of his chariot bend down their necks, their eyes touched by the chowries in their ears and their manes pressed down by the yoke."*

This description of the westering sun driving "his downward team" amplifies the idea in Ovid's lines,

> "Pronus erat Titan, inclinatoque tenebat
> Hesperium temone fretum."

"The western horizon wears a streak of the evening red, all the rest of the sunshine being gone, as a battle-field displays a bloody scimetar uplifted aslant."†

"Yonder moon, O fairfaced one, is united to its constellation with trembling light, as a bridegroom with his newly-won bride still trembling with fear at her new lord."‡

We do not remember to have ever seen before in Hindu poetry an allusion to the phenomenon of *the rainbow* over a waterfall, such as we find in the following lines.

"As the sun sinks, destroying the connection of his rays with the waterdrops, the cataracts of thy father Himálaya lose their rainbow-halo."§

It would be premature to pass a definite judgment on the authorship of the poem, until we have seen some of the other cantos. Dr. Aufrecht, in his Catalogue, has passed an unfavourable report on them, "hi

* सोऽयमानतशिरोधरैर्हरैः कर्णचामरविघट्टितेक्षणैः ।
अस्तमेति युगभग्नकेसरैः सन्निधाय दिवसं महोदधौ ॥

† सान्ध्यमस्तमितशेषमातपं रक्तलेखमपरा बिभर्ति दिक् ।
सम्पराययसुधा सशोणितं मण्डलाग्रमिव निर्यगुत्थितं ॥

‡ एष चारुमुखि योग्यतारया युज्यते तरलबिम्बया शशी ।
साध्वसादुपगतप्रकम्पया कन्यया नवदीक्षया वरः ॥

§ शीकरव्यतिकरं मरीचिभिर्दूरयत्यवनते विवस्वति ।
इन्द्रचापपरिवेशशून्यतां निर्झरास्तव पितुर्व्रजन्त्यमी ॥

libri utrum à Kálidásâ profecti sint necne, in præsentiâ quidem dijudicare incautum esset; quæ equidem legi, mirum in modum frigere mihi videbantur;" but certainly though some verses in this eighth canto are unworthy of Kálidása, many would do him no discredit.

In conclusion we may add that there are several allusions to this eighth canto in Hindu literature. Thus the Sáhitya Darpaṇa (Book iii. §. 218), in its account of *mána* or '*amantium iræ*,' refers as its example to Párvatí's displeasure at the description of the evening by S'iva, and his wish to perform the evening rites, and quotes it as from the Kumára-Sambhava. The Das'a Rúpa in book iv. §. 12, quotes anonymously the lines beginning—

एवमास्ति निगदीतसाध्वसं ।

which are the fifth S'loka of the present edition. But the most important reference is one in the second book of the Sankshipta Sára, which, in its account of námadhátus, gives the following sútra and commentary.

दूराद् वा ॥ दूरयति दवयति । दूरयत्यवनते विवक्षतीति कालिदासः.

This is important as not only quoting a verse of the eighth canto (s'l. 31,) but as mentioning the poet's name.

E. B. C.

Since writing the above we have learned that Dr. Bhau Dájí is printing these cantos of Kálidása in Bombay. He has succeeded in finding Mallinátha's Commentary to the eighth.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR APRIL, 1862.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 2nd instant.

A. Grote, Esq., President, in the chair.

Presentations were received :—

1. From Dr. Hunter, under instructions from His Excellency Sir W. Denison, a set of Capt. Tripe's photographs of Tanjore, Trivady, Madura, Poodoocottah, Trichinopoly, Rya Kotta and Seringham, of an inscription around the basement of the Binanum of the Great Pagoda at Tanjore, and of the Elliot marbles and other objects in the Madras Central Museum.

2. From Mr. C. Metcalfe, an inscribed slab from Rajshahi recording a grant of land made by Vijaya Sena, a monarch of the Sena dynasty of Bengal.

3. From Capt. E. Smyth, skins of a yak, a thar, a burral and a musk deer.

4. From Major Anstruther Thomson, a young cuttle fish in spirit.

5. From Capt. F. W. Stubbs, a small silver coin of Alexander the Great.

With reference to this coin the following note was communicated by Mr. E. C. Bayley :—

"No small coin of Alexander the Great so minute as the present has as yet been certainly found in India. Coins of the same size, however, of the Bactrian kings Demetrius and Eukratides are not uncommon. I am inclined to think the present type was struck in Alexander's Eastern possessions."

6. From Major S. R. Tickell, a specimen of a Turtle, *(Sphargis Coriacea)*.

7. From Mr. Becket, Gurhwal, a collection of specimens of birds consisting of Tibetan Gallinaceæ.

8. From Mrs. Major Turnbull, two stuffed squirrels.

9. From Major J. L. Sherwill, several boxes of specimens of coal, limestone, and minerals from Pundeeni mountain in the Manbhoom district.

10. From Mrs. Brandis, two bird skins.

11. From J. G. Thompson, Esq., two bird skins.

A rare silver coin of Altumsh, found in re-excavating a tank at Kandi in the Moorshedabad district, lent by Babu Gour Doss Bysack, was exhibited; in reference to which Mr. Bayley communicated the following remarks:—

"The coin is curious, for it gives the Khalif's name wrong, *i. e. Mostanser be amr illah* instead of *Mostanser billah*, and it is also curious as wrong, the word for the denomination of the coin *al sika* not *al dirhem* as is usual. I have never I think met "al sika," save on a later gold coin. The date is A. H. 680.

The following notice was submitted on the part of the Council:—

The Council beg to notify that they propose, for the consideration of the Society, the following additions and amendments in the Code of Bye-Laws:—

1. To amend Rule 43 by the insertion of the words "unless originated by the Council" after the word "then" in line 5.

2. To add the following clauses to Rule 46:—

The Council shall have the power of appointing any other day not later than that day fortnight for the Annual Meeting.

After the termination of the regular business of the Annual Meeting, the Meeting may be considered an ordinary general meeting.

3. To omit clause 1 of Rule 60 which provides that the names of the visitors allowed to be present at the meeting shall be read aloud by the chairman.

Ordered that the amendments, &c., be referred to the Council for report, in accordance with the provisions of Rule 43.

Mr. Oldham gave notice that he should move at the next meeting that the following clauses should be added after Rules 78 and 86 respectively:

One Vice-President and three members of the Council shall be changed annually.

The office of President shall not be held by the same person for more than two years in succession, but after the lapse of one year, the same person shall be re-eligible.

Ordered that these amendments be also referred to the Council for report at the next meeting.

The Council reported for confirmation that they had raised the wages of the younger Swaries, taxidermist, from Rs. 20 to Rs. 30, and of Nicholas from Rs. 6 to Rs. 10.

Approved.

They also reported that they had appointed Col. R. Strachey a member of their body in the room of Col. Yule, who had left India.

The following gentlemen duly proposed at the last meeting were balloted for and elected ordinary members:

C. U. Aitchison, Esq., C. S.

F. A. E. Dalrymple, Esq., C. S.

Lieut.-Col. H. W. Norman, C. B.

Babu Rajkissen Roy, Zemindar of Berhampore.

J. A. P. Collis, Esq., M. D.

E. G. Glazier, Esq., C. S.

Major H. Raban, Bengal Army.

The following gentlemen were named for ballot as ordinary members at the next meeting.

Babu Dhunpati Singh Dooghur, Baloochur, Moorshedabad,—proposed by Babu Gour Doss Bysack, seconded by Mr. Atkinson.

S. B. Partridge, Esq., M. D., Officiating Principal of the Medical College,—proposed by Dr. Fayrer, seconded by Mr. Atkinson.

A letter from Mr. H. Stainforth, desiring to withdraw from the Society was recorded.

Communications were received.

1. From Major S. R. Tickell, a description of a turtle *Sphargis Coriacea*.

2. From Babu Goopeenath Sein, Abstracts of Meteorological Observations, taken at the Surveyor General's Office in the month of October last.

3. From Major J. L. Sherwill, Revenue Surveyor, a letter to the President on the subject of the Manbhoom coal fields.

4. From Major J. L. Sherwill, an account of a visit to Kunchinjinga.

Dr. Simpson read this paper to the meeting, and exhibited some photographic views of places mentioned in it.

The paper will appear in one of the fortheoming numbers of the journal.

Captain Montgomerie presented to the Society a memorandum on the geographical positions of the principal cities and towns of Eastern Turkistan, and exhibited a photograph by Lieutenant Melville from the field sheets of the Kashmir series, shewing the glaciers of the Shigar valley on a scale of four miles to an inch.

After explaining that the positions in Turkistan were derived entirely from Great Trigonometrical Survey data and materials collected on the Hindustan side of the Mustak and Karakorum passes, Captain Montgomerie proceeded to read some notes on the Brahma, Kun and Nun, Zanskar, Mustak and other glaciers.

He pointed out that as he had anticipated in his former memorandum, these glaciers have proved to be of the most gigantic size, so large, indeed, that compared with them the glaciers of the Alps must be reckoned as of the second order.

The glaciers surveyed by Capt. Montgomerie's party may be divided into those of the Himalayan and Mustak water-sheds. The glaciers of the Himalayan water-shed can boast of a large number varying in length from five to fifteen miles, the largest being the Drung-Drung glacier of fifteen miles, and there are others over eleven miles in Zanskar, the Brahma glacier of eleven and a half miles in Wurdwun and the Purkutsi glaeier of seven and a half miles in Sooroo, besides a multitude of minor glaciers. The Purkutsi gunri or glacier is perhaps the most remarkable of the whole of this group, as it comes tumbling down in a torrent of broken and pinnacled ice from near the summit of the Kún peak which rises upwards of 23,000 feet above the sea, a sight well worth looking at, though in actual length the glacier is somewhat inferior to others in the neighbourhood; it makes up for the want of length by the large mass of ice that is visible from one spot.

The next group of glaciers referred to by Captain Montgomerie was that of the Mustak, consisting of those in the Saltoro and Hushe valley around the splendid peaks of Mashabrum, and his neighbours

which rise to upwards of 26,000 feet above the sea. The most remarkable glaciers in the Saltoro valley, taking them from east to west, are the Sherpogong glacier 16 miles and the Koondoos 24 miles in length; in the Hushe valley the Naug glacier 14 miles in length and the Atosir glaciers 13 and 11 miles in length.

The next group referred to was that of the Mustak on the Bráldo and Báshá branches of the Shigar river. The Bráldo boasting of the Baltoro glacier no less than 36 miles in length, with a breadth of from 1 to 2½ miles; the Punmah and Nobundi Sobundi glaciers, the longest, of which is 28 miles in length and the Biafo gáusè or glacier with a direct length of 33 miles without reckoning its upper branches. The Biafo gause forms, with a glacier on the opposite slope towards Miggair, a continuous river of ice of 64 miles running in an almost straight line, and without any break in its continuity beyond those of the ordinary crevasses of glaciers.

The Biafo glacier is supplied in a great measure from a vast dome of ice and snow about 180 square miles in area, in the whole of which only a few projecting points of wall are visible.

Further west the Hoh valley produces a fine glacier 16 miles in length.

The Báshá valley contains the Kero glacier 11 miles in length, the Chogo glacier 29 miles in length, besides, many branches and minor glaciers. The Braldo and Basha, in fact, contain such a galaxy of glaciers as can be shewn in no other part of the globe, except it be within the Arctic circle.

Captain Montgomerie pointed out that the Baltoro, with its main glacier 36 miles in length and its 14 large tributary glaciers of from 3 to 10 miles in length, would form a study in itself, and give employment for several summers before it could be properly examined. The small photograph of the Baltoro glacier (taken from a sketch by Captain Austen) shews at a glance the wonderful number of gigantic moraines which streak the Baltoro glacier with 15 lines of various kinds of rock, viz., grey, yellow, brown, blue, and red, with variations of the same, all in the upper part quite separate from one another, but at the end of the glacier covering its whole surface so as to hide the upper part of the ice entirely. In the centre of these moraines there was a line of huge blocks of ice which had not been observed on other glaciers, and which it is difficult to account for. The Baltoro

glacier takes its rise from underneath a peak 28,287 feet high. Captain Montgomerie was in a considerable state of alarm at one time lest this noble peak should turn out to be in Turkistan. Captain Austen has, however, removed all anxiety on that score, as one side of the peak at any rate is in Her Majesty's dominions.

Captain Montgomerie noticed that all glacier phenomena were to be found on a gigantic scale in the Shigar valley. The crevasses in the ice were of great breadth and of the most formidable description. An attempt was made to measure the thickness of the ice by sounding one of these yawning chasms, but a line of 160 feet in length failed to reach the bottom of it. Observations made at the end of the glaciers gave a thickness of 300 or 400 feet, but doubtless higher up a still greater thickness of ice will be found.

The surface ice was regularly drained by streamers with large lakes of a-half to two miles in length, the whole water occasionally disappearing down great holes or "moulins" in the ice with a loud intermittent roaring noise.

The glaciers being on such a gigantic scale, it, of course, took days and days to explore one of them. In the smaller glaciers no particular precautions had to be taken, but in the Shigar valley it was absolutely necessary to tie all the men of the party together with rope, giving about ten yards between each so as to save any one who might slip into a crevasse. Implements for cutting ice were in constant requisition and altogether it was a service of considerable danger exploring the larger glaciers.

The exposure involved in such explorations is evident from the number of days for which it was necessary to encamp on the ice at a great elevation with a limited supply of food and fuel which had to be carried for the whole trip. The economy necessary in fuel was more especially trying to Captain Austen and his party.

Captain Austen made the detailed survey of the Shigar valley and its vast glaciers. Lieutenant Melville did the same for the glaciers of the Sooroo, Zanskar and Butuai, Mr. Ryall those of the Saltoro valley; Mr. Todd those of the Brahma group. Captain Montgomerie considers that to all of them (and more especially to Captain Austen) the greatest praise is due for their untiring devotion to a most arduous and trying task, and for the skill with which they have accomplished it.

A vast field for exploration having been thus opened out by the Kashmir series, Captain Montgomerie hoped that the Journal of the Society would hereafter be filled with a mass of interesting detail regarding these glaciers. Should any Alpine explorers from England be tempted to visit this interesting field of research, Captain Montgomerie promises them glaciers and mountains worthy of their exertions, and he added that the officers of the Trigonometrical Survey would be prepared to supply every assistance in the way of data as a basis for more minute inquiries.

He reiterated that, as compared with the Shigar glaciers, those of the Alps may be considered of the second order, the best known one —the Mer De Glace—being about 7 miles in length and the largest, the Aletsch glacier being a little over 15 miles in length, whilst the larger ones surveyed by the Kashmir Series on the Braldo, &c., varied between 15 and 36 miles in length.

Captain Montgomerie concluded by saying that he hoped hereafter, when next summer's researches were finished, to draw up a more complete account of these magnificent glaciers. Meantime he trusted that the rough notes which he had hurriedly put together would give a general idea of their vast extent and of the importance of their addition to our knowledge of the physical geography of the globe.

Captain Montgomerie subsequently spoke as to the advisability of employing native agency for the purpose of adding to our knowledge of Central Asia and other countries. He thought that natives of the north of India might be trained to take latitude observations and to make rough route surveys. The work of such natives would be tested in ground already explored by Europeans, and numerous other precautions might be taken to insure accuracy. Explorations in Central Asia had hitherto been most dangerous to Europeans, but natives of Hindostan went there constantly and returned in safety. For instance, the Commissioner of Peshawur had lately sent the Moola Abdul Mujeed from Peshawur *viâ* Cabul, Kundooz, Badakshan, and across the steppe of Pamir down to Kokan with a letter and presents from His Excellency the Governor-General to the Khan. The Moola returned in safety, and beyond the physical difficulties, such as crossing the plains of Pamir then covered with snow, he had no interruption, and if he had been able he could have taken latitude observations and made a rough route survey without any danger.

The Jesuits in China had sueeeeded in collecting geographieal materials by means of the Chinese trained by themselves, whieh have subsequently been proved to be good, and Captain Montgomerie did not see why the English should not get at least as good work out of some of the natives of Hindostan. Captain Montgomerie re-eommended the subject to the eonsideration of the Counеil of the Soeiety, and he was prepared to draw up a projeet for employing natives in exploration if the Council thought it advisable.

Thanks were voted to Captain Montgomerie for his interesting eommunication.

The Librarian submitted the usual monthly report.

The following is a list of books &c. added to the Library since the Meeting in March.

Presented.

Vividhartha Sangraha, No. 79.—By the Editor.

Calcutta Christian Intelligeneer for 1861.—By the Right Rev. the Bishop of Calcutta.

The Oriental Baptist for March.—By the Editor.

The Oriental Christian Spectator for January.—By the Editor.

Selections from the Records of the Government of the N. W. Provinces, No. 35.—By the Government N. W. Provinces.

Photographs of the Elliott Marbles and other subjects in the Central Museum, Madras. By Capt. Tripe.—By the Madras Government.

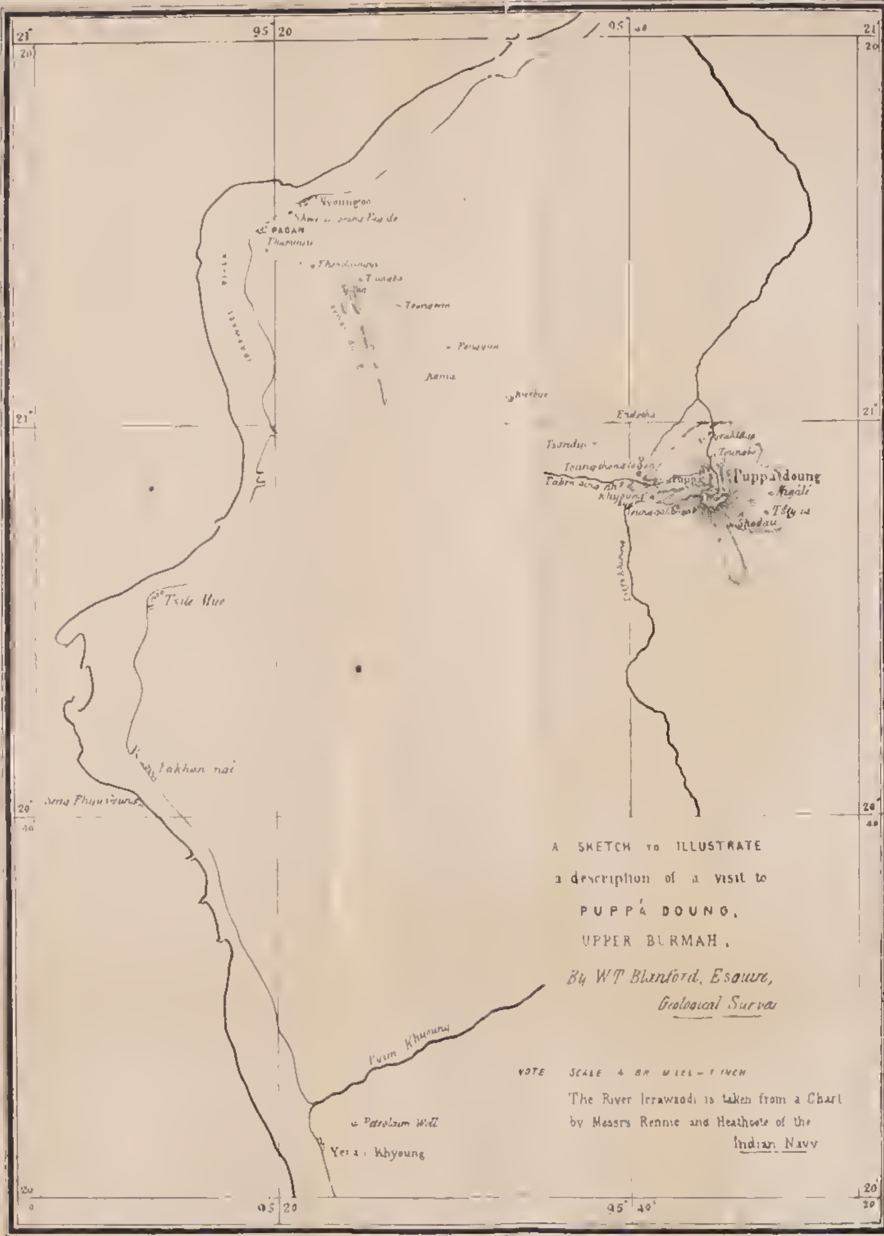
Photographic Views in Tanjore and Trivady.—By the same.

Ditto Ditto of Seringham, Trichinopoly, Poodoocottah, Ryakottah and other places in the Salem District.—By the same.

Ditto Ditto in Madura District, Parts 1, 2, 3 and 4.—By the same.

Ditto Ditto of an Inscription around the basement of the Bimanum of the Great Pagoda at Tanjore.—By the same.

La'lgopa'l Dutt.



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